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AT

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## DEDICATION

As we progress along the path on our journey through life, we sometimes reach a point at which we need to pause and take our bearings, gaining a perspective on where we have been, where we are, and where we are going. The completion of this project is one such point. As such, I would like to dedicate this paper to those who have been so important in where I have been, where I am, and where I am going in my journey.

To my father who taught me to question, to investigate, to search, to accept challenges, and the fun in finding the answer.

To my mother who taught me about laughter, friendship, strength, love, and hope.

To my husband who is my lifetime friend, companion, and mentor; who has given me his love, patience, and support; and who has taught me so much about perspectives and perceptions.

To my children who have given me more happiness and fulfillment than I ever thought possible and who have taught me about life and a special sort of love.

## I. INTRODUCTION

### CONDITIONS WHICH PROMPTED THE STUDY

The provision of quality health care is an intrinsic concern of every health care provider and institution. Not only do the provider and institution have a basic responsibility to society to guard, protect, and insure appropriate use of the massive amount of resources put into the health care system, but they must also respond to the demands of professionalism, motivating the provider and institution to "do a good job." In addition to the basic intrinsic motivation to provide quality health care, the military health care provider and institution have been affected by external sources examining and often criticizing the quality of care provided (1-4). Although individual providers have been the focus of the majority of criticisms, several system failures have also been identified. Recent Inspector General and U.S. Army Audit Agency reviews have identified significant quality assurance system deficits throughout the Army medical treatment facilities (5). The Surgeon General of the Army, Lieutenant General Becker and Health Services Command have identified quality assurance as a major area of emphasis (6).

Current quality assurance programs are designed to meet the JCAH requirement (7) that there be an "ongoing quality assurance program designed to objectively and systematically monitor and evaluate the quality and appropriateness of patient care, pursue opportunities to improve patient care, and resolve identified problems."

The problem facing the administrator in the assessment of quality of



care is that, in most cases, the assessment must be based on clinical knowledge and judgement. Because so many elements of the health care delivery system which impact on the quality of care provided are under the direct control of the administrator, he/she has a responsibility to establish mechanisms to objectively and systematically monitor these elements.

Monitoring the quality of care in the ambulatory setting is particularly difficult due to some unique features. By its very nature, ambulatory health care is often provided in a variety of settings over a period of time. Coordination of all of the services provided is a primary quality assurance responsibility of the administrator. Although documentation of the encounter is the responsibility of the provider, the compilation of reports and maintenance of the medical record is the responsibility of the administrator. Accomplishment of the administrator's quality assurance duties in the ambulatory setting is complicated by the active role the patient must play in his/her own care. Accessibility and other system features must be in place to secure patient compliance with treatment orders.

One of the major problems in the quality assurance programs for the ambulatory setting is that most address fragmented aspects of the health care delivery system. The appropriateness of a diagnosis and treatment orders are examined by patient encounter. Medical records are reviewed as a separate element. Laboratory reviews are conducted separately from radiographic reviews. Although there are justifiable reasons for separate reviews, there does not appear to be a mechanism to assess the essential coordination aspect of the ambulatory health care setting. How can the administrator insure the elements of the delivery system under his/her control support and accomplish the practitioner's treatment orders in a coordinated and timely manner?

In view of the absence of an established mechanism to assess the

contribution of the various structural and process elements of the ambulatory health care setting in the coordinated and timely accomplishment of practitioner orders. it is proposed that a study be conducted on the feasibility of an evaluation tool examining specific administrative areas of responsibility at Brooke Army Medical Center.

#### **STATEMENT OF THE RESEARCH PROBLEM**

The intent of this study was to examine the feasibility of a tracking mechanism and patient survey as a means of directly and indirectly assessing specific administrative functions in the health care delivery process.

## II. REVIEW OF RELATED LITERATURE

### AMBULATORY CARE

In a sense, ambulatory health care originated with the earliest healers of primitive societies. Until the advent of institutional care, all care was provided on what may be considered an "ambulatory" basis (8).

As hospitals came into existence, various and sporadic forms of outpatient care were provided. Ambulatory care as it is known today can be traced to mid-seventeenth century France where physicians were regularly assigned to advise the poor (9). The first hospital outpatient clinic in the United States (U.S.) was founded some 150 years later in 1751 in the Pennsylvania Hospital of Philadelphia. Several other clinics were opened in other major U.S. cities through the eighteenth century. These were designed primarily to serve the poor who did not have access to private physicians (10).

Although the "health center movement" (11) and the Great Depression of 1929 significantly increased the number and utilization of ambulatory care services, the actual nature of care provided changed very little. It was not until the post World War II era, with the tremendous increase in medical knowledge, complex technology, and increasing specialization, that society experienced significant changes in the settings and nature of ambulatory care services (12).

Ambulatory care has increased significantly since that time due to the increasing specialization and technological developments. Ambulatory care is now provided in a wide range of settings from the hospital outpatient

department to school and industrial clinics and private group practices (13). Utilization of ambulatory care services has increased at an amazing rate. In the most recent American Hospital Association survey (1984), U.S. hospitals reported 277 million outpatient visits. This represents a 120% increase over the total hospital outpatient visits in 1965. Accordingly, the total average daily census for all U.S. hospitals has decreased 31% from 1,403,000 in 1965 to 970,000 in 1984. Hospital occupancy has also decreased from 82.3% in 1965 to 72.5% in 1984. This data clearly describes the trend toward the ambulatory care setting. Roemer (14) attributes this trend to several factors.

1. The increasing complexity of the health sciences which has demanded coordination and teamwork for their proper application.

2. The demand for medical services has steadily risen for many reasons including heightened education, expanded economic support mechanisms, and improved transportation. However, the resources of private medical practice have been decreasingly capable of responding to this increased demand.

3. Physicians have become increasingly specialized with a consequent decline in availability of general practitioners. This has been frustrating for patients, who use organized entities to see "some sort of doctor."

4. The rising costs and prices for medical care.

5. The rising appreciation of health care as an essential service, for which society should take responsibility.

There is no doubt that the ambulatory care setting will be a key in future health care delivery systems. Authorities have cited the increasing organization, the increasing utilization, and the increasingly recognized

cost efficiency of ambulatory health care services as evidence for this conclusion (15). The ambulatory health care setting represents the state of the art method of meeting most health care needs.

Recognizing the growing importance of the ambulatory care setting, administrators must be prepared to deal with one of the most important issues in health care today, that of quality assurance. The administrator and clinician in the ambulatory health care organization must ask, given the unique features and complexities of the this setting, is there an effective and efficient method of assessing and insuring the quality of care?

## QUALITY ASSURANCE

To assess the quality of medical care one must first unravel a mystery: the meaning of quality itself. It remains to be seen whether this can be done by patiently teasing out several strands or whether one must, in despair, use a sword to cut the Gordian knot. (16)

Somewhere, deep within the recesses of professionalism, all health care providers and administrators find a commitment to the provision of quality health care. However, those who have studied this imperative, have found, as Donabedian described, a Gordian knot. How can quality be defined, described, grasped, and, most importantly, assessed and provided?

As with most scholarly studies, theory will provide a starting point in the unraveling of the "mystery" and the practical application of what has been learned will be the ultimate goal. The journey to this ultimate goal will involve exploration of several points along the way. The traveler along this path will gain an understanding of the concept of quality; of the important quality issues of access, continuity, coordination, and compliance; of an administrator's model for quality assurance; of the impact of quality assurance; of the practical components of the assessment process including target prioritization, criteria, standards, norms, and data sources; of the quality assessment tools available for the ambulatory health care setting; and, finally, of a practical tool for the quality conscious administrator.

In his widely referenced book, Donabedian also starts at a point of confusion in search of the elusive definition of quality.

What is by no means clear is whether quality is a single attribute,

a class of functionally related attributes, or a heterogeneous assortment gathered into a bundle by established usage, administrative fiat, or personnel preference. And the identity of the attribute or attributes that constitute quality is not clear at all (17).

To provide some clarity, Donabedian focuses on the object of concern, the practitioner treatment of a patient for an episode of illness. With that, it becomes clear that the care provided can be divided into two areas, the technical ("science") and the interpersonal ("art") (18).

The concept of "quality" by its nature is a societal definition. "Quality" in the United States has a very different meaning from "quality" in India. Accordingly, values, norms, and expectations can be very different in different societies (19). Recognizing this, Donabedian again provides direction in the "great search." He proposes the interpersonal aspect of the healing encounter be defined and evaluated based on societal values and norms. He also proposes that technical care be defined as the application of science and technology in a manner which maximizes the benefits to health while insuring the accompanying risks remain at or below a socially acceptable level (20). In short, as Donabedian stated, the provision of quality care can be summarized as, "at least to do no harm; usually do some good; and ideally to realize the greatest good that is possible to achieve in any given situation" (21).

As simple, clear, and straightforward as this concept now appears, the inquisitive practitioner or administrator is driven to ask, how much care is "good", and at what cost should it be provided? Obviously medical care can not be provided on the rationale that if some medical care is good, more must be better. Referring to Donabedian's earlier concept of risks and benefits, it is clear that at some point the risks associated with more care will

outweigh the benefits. Accordingly, there is a point at which the cost of the additional medical care is greater than the value of the benefits received from that care. To illustrate those concepts, Donabedian provides a graphic demonstration of the relationships between risks, benefits, costs, and utility and the quantity of medical care provided (Figure 1). It can be seen that the benefits and utility of benefits from medical services increase sharply initially but the benefits reach almost a plateau as the volume of services increase and the utility of the benefits actually decreases. Accordingly, the risks and costs associated with the care provided are relatively small initially, but rise at an increasing rate as more services are received.



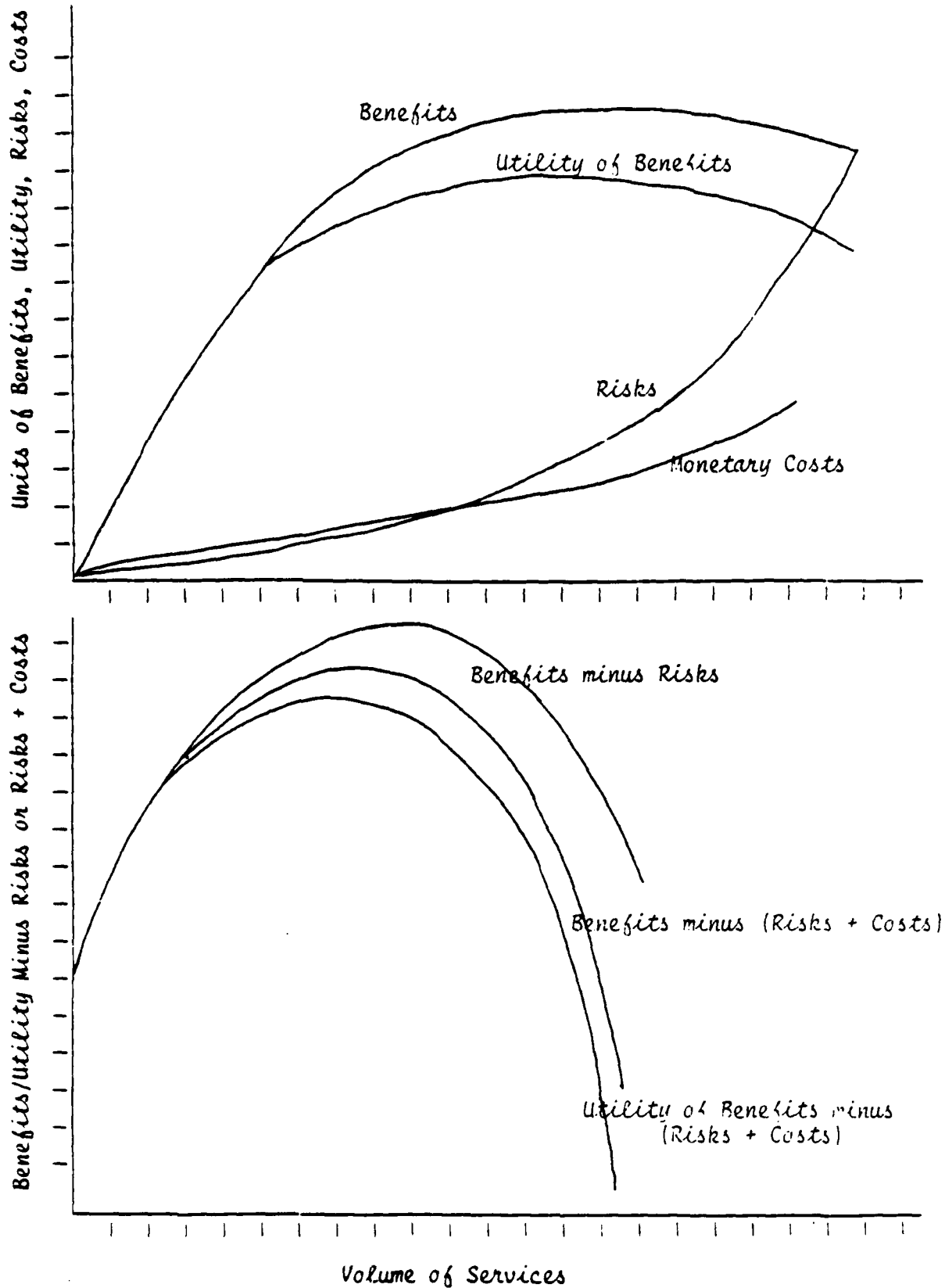


FIGURE 1  
Donabedian's  
Hypothetical Relationships

## ACCESSIBILITY, CONTINUITY, AND COMPLIANCE

To inject a milliliter of practicality at this point, the quality of care evaluator must realize that the definitions, valuations, and expectations of "quality", "risk", "benefit", "cost", and "utility" will vary by viewpoint, the type of treatment, and setting (22). Aspects of the "healing encounter" not directly under the control of the practitioner will also influence the evaluation of care. The administrative functions of access and coordination are key quality of care issues.

In his interpretation of a U.S. Department of Agriculture report on the problems of health services in rural areas, Anderson defines access as, "the availability of financial and health system resources in an area" (23). Anderson attributes much of access to health policy issues such as financing, education, manpower, and organization. He also cites characteristics of the health delivery system such as the volume and distribution of resources and the organizational structure and entry mechanism as contributing to access (24). However, Anderson also agrees with Mechanic (25) that patient characteristics have a significant impact on access. Not only are the patient's financial resources included in these characteristics, but also his/her health attitudes, knowledge about health care, and internalized social and cultural definitions of health and illness.

The coordination or continuity of medical care provided will exert significant influence on the results of any quality of care evaluation. Shortell (26) defines continuity of care as, "the extent to which services are received as part of a coordinated and uninterrupted succession of events consistent with the medical care needs of patients." Donabedian (27) agrees with this definition, "coordination may be regarded as the process by which

the elements and relationships of medical care during any one sequence of care are fitted together in an overall design." Fundamental to the concept of coordination is the issue of information availability. Historical information on past evaluations, findings, and treatments is essential to provide appropriate current treatment based on an enhanced understanding of the patient's medical problem, his/her situation, values and expectations. It is recognized that coordination or continuity is better if the care is centralized to one source. In this way, medical care can be enhanced by the first hand historical perspective of the patient's medical problem. Expensive duplication of services can also be avoided when the health care delivery system, provides appropriate coordination (28).

One of the ultimate goals of addressing the issues of accessibility and continuity is to gain the participation and cooperation of the patient in the medical treatment. Patient satisfaction with the accessibility and coordination of care as well as with the interpersonal competence of the practitioner and ancillary personnel has been shown to contribute much to the patient's participation in the treatment (29). Patient participation or compliance is not only important as it relates to the final outcome of health, but also as it relates to the health care system functioning.

As numerous authors (30-36) have discussed, patient non-compliance is a major problem for the health care delivery system as it consistently results in wasted resources (staff time and financial resources) as well as reduced accessibility of other patients to needed care. In some cases, non-compliance can threaten the viability of the delivery system itself.

Becker (37) discusses the magnitude of the problem with patient compliance. It is estimated that only one third of patients correctly follow physician directions. Scheduled appointments are missed 20% to 50% of the

time. Approximately 50% of patients do not take prescribed medication in accordance with the instructions, and recommended behavioral changes such as smoking cessation and dietary restrictions are even less frequently accomplished. Becker summarizes the problem, "some authorities have come to view the difficulty of enlisting patient adherence as the most serious problem facing medical practice today" (38).

Studies (39-42) have shown that the non-compliant patient usually has certain demographic features. Variables which appear to be related to compliance include race, age, family size, social disintegration, and interpersonal family relationships. The low income, medically indigent group has been shown to have a significantly greater tendency toward non-compliance (43,44). In terms of the influence of extraneous variables on compliance, season, weather, and the day of the week, interestingly, had no impact on compliance (45,46).

Lack of patient knowledge or understanding of the treatment regime has also been suggested as a major factor in non-compliance (47,48). Along the same lines, other researchers have identified unmet expectations; lack of warmth in the practitioner-patient relationship; and the failure to receive an explanation of the diagnosis or cause of illness as the key factors in non-compliance (49). When the non-compliance involves adherence to a treatment regime, one author stated, "reduced adherence occurs when the regime is complex, of long duration, dependent on an alteration of the patient's lifestyle, inconvenient, or expensive" (50).

Still other studies have been conducted to identify the major reasons for possibly the largest area of non-compliance, missed appointments. The most common reasons for failing to attend a scheduled appointment include, forgetting the appointment and confusion about the date; a long time until an

appointment became available; and transportation or work difficulties (51-53).

It is important for the administrator and practitioner to maintain an awareness of the significance of patient satisfaction and compliance, not only to conduct a well grounded quality of care assessment, but also to respond to problems and insure the negative consequences of patient non-compliance do not occur.

## DEVELOPMENT OF AN ADMINISTRATOR'S MODEL

Having clarified the essential elements of technical and interpersonal care, accessibility, continuity, and patient compliance, the search for a method to assess the quality of care can resume. Numerous models have been proposed which describe the treatment encounter and provide a framework from which an assessment of the quality of care can be made. Possibly the most widely accepted of these models is Donabedian's "Structure, Process, Outcome."

"Structure" in this sense is defined as the "relatively stable characteristics of the providers of care, of their tools and resources they have at their disposal, and of the physical and organizational settings in which they work" (54). Included in this definition are the resources of the organization (financial, physical, and personnel); the distribution of these resources; the quality and mix of the resources (e.g. practitioner qualifications and staff mix); administrative policies and procedures - to include quality of care reviews; and the organizational structure. Donabedian explains the significance of structure in the assessment of the quality of care depends on the nature of its influence on care. "Structure" can provide an indirect reflection of the quality of care in that certain structural features either increase or decrease the probability of good performance. "Structure" is of great importance to the administrator as it involves the planning, design, and implementation of systems intended to provide health care, primarily administrative functions. However, "structure" is, as Donabedian described, a "blunt instrument" in the assessment of quality care. "Structure" as an assessment tool is limited due to its lack of specificity and sensitivity and the ill-defined relationships

between structure and performance (55). So, for the administrator in search of an answer, the journey has not ended.

Donabedian describes "process", the next step in the continuum, as the conduct of the actual encounter. Included in this are such features as the timeliness or delays in seeking care; the use of services related to need (e.g. diagnostic procedures); interpersonal interactions; choice and use of treatments, referrals, and follow-up appointments. Evaluations of "process" features in the assessment of quality require some sort of causal validity linkage, evidence that specified processes produce specified outcomes under specified conditions (56). Without this evidence, no conclusion is possible about the quality of care using "process" as the basis for assessment.

Although the final link in the continuum, "outcome" is an indirect indication of the quality of care provided, it is possibly the most significant element as it addresses the ultimate objective of the healing encounter. Donabedian defines outcome as the, "change in a patient's current and future health status that can be attributed to antecedent health care" (57). There have been numerous definitions of health proposed, however, for purposes of quality of care assessment, the outcome of health must be defined, as mere "benefit", "cost", "risk". and "utility", based on societal values, norms, and expectations. It is important to remember that outcome should not only include "health" but also, patient and practitioner satisfaction with the encounter (58). Evaluation of "outcome" as an indicator of the quality of care provided is also dependent on the establishment of a valid linkage between the outcome and the antecedent care. Intervening factors which influence the final outcome must be identified and taken into consideration in the evaluation process.

As previously stated, other models have been proposed as frameworks for

the evaluation of the quality of care; however, as Donabedian discussed and graphically demonstrated, all of the proposed models contain essentially the same elements of structure, process, and outcome and view the encounter as a functional continuum (59).

At this point, the administrator in search of his/her role in the delivery of quality care may be somewhat confused. Although there is a simplistic and understandable logic from a global perspective in Donabedian's continuum,

STRUCTURE----->PROCESS----->OUTCOME

the practical application of this for the administrator lacks the same clarity. Some aspects of the administrator's role fall in the area of "structure" and others can be classified as "process". Some delineations of responsibilities within these areas lack the clarity needed for the administrator to appropriately contribute to the process of quality care delivery. In view of Donabedian's statement that, "the reader should feel free to ... develop a formulation that combines elements of several [models], or to create a new formulation of his own" (60) and, at the risk of appearing presumptuous, a systems theory modification of Donabedian's health care delivery model is proposed by this writer (Figure 2).

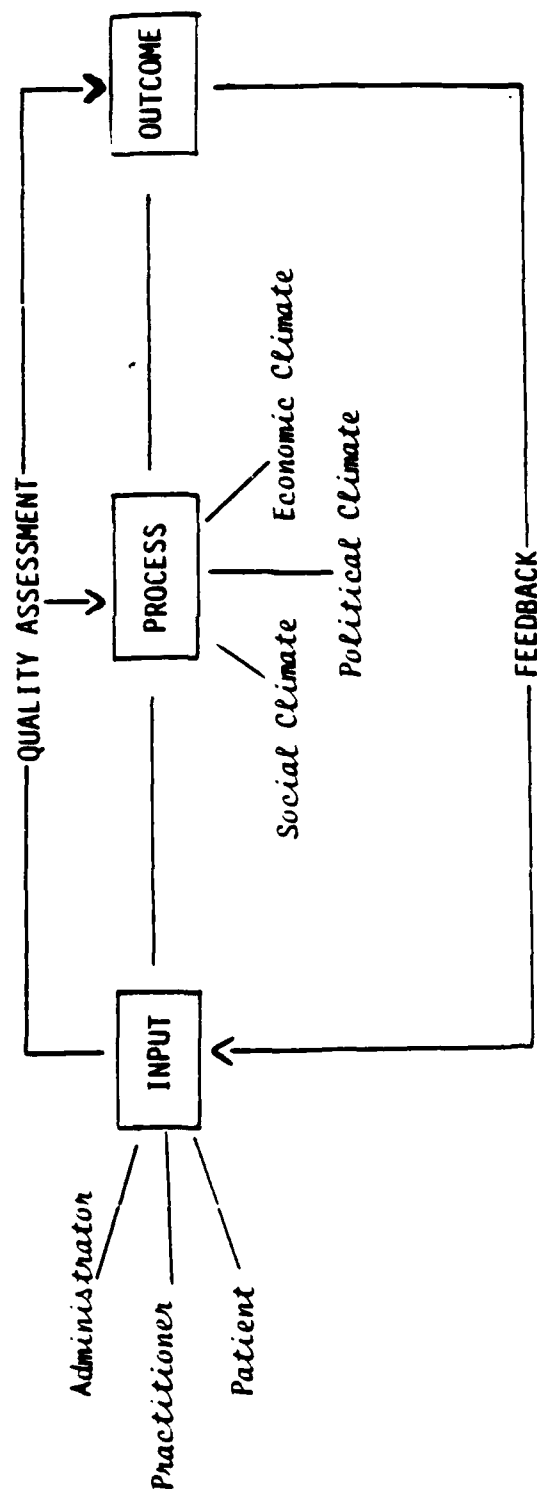
In this model, the three important inputs are identified, the practitioner, the patient, and the administrator. The practitioner "input" includes not only the technical skills, knowledge, and expertise, but also the interpersonal skill previously discussed. In this model, "practitioner" includes not only the primary physician, but also the ancillary staff supporting the clinical evaluation and treatment of the patient. The patient "input" in the model includes many of the previously discussed characteristics such as available resources; attitudes and expectations;



FIGURE 2

A

SYSTEMS THEORY MODIFICATION  
of DONABEDIAN'S MODEL



family and social situation; knowledge; health motivation; and compliance tendencies (61,62). Finally, the administrator "input" includes such functions as the planning and design of the organization; its financial management; personnel and other resource allocation and management; the establishment of policies and procedures; the establishment and management of information systems; and the establishment and management of the entry (access) mechanisms. Although most of these functions may be classified as having an "indirect" influence on the process, they are nonetheless essential for the encounter to occur. These three major inputs interact in the area Donabedian referred to as "process". The difficulty in clearly defining "process" is that there are possibly several thousand ways these three elements may interact and the influential but uncontrollable variables of political, social, and economic changes may further complicate the interaction process. "Outcome" in this model is adopted from Donabedian's definition, a change in the socially defined state health and satisfaction with the encounter. This model faces the same problem previously discussed by Donabedian, validity. Given the multitude of process interactions which may occur, how can the outcome validly be attributed to the inputs? Unfortunately, as with Donabedian's model, there is no good answer for this question. Situational cause and effect relationships is the only basis available for assessment and modification.

It is important to note that the assessment/feedback mechanism is an essential component of this model. Based on the information from this mechanism, modifications to the only "controllable" elements in the model, the inputs, can be made. Theoretically, if this were a totally responsive system, a homeostasis would soon be achieved and the highest quality care possible, given the unknown political, social, and economic fluctuations.

would consistently be provided.

This model will be utilized as this review of the literature continues as it specifically addresses the major area of concern for this project, the administrator's role in and assessment of the provision of quality health care.

## THE EFFECT OF QUALITY ASSURANCE

As this review proceeds from the theoretical to the operational, the first question which must be addressed is, what benefit does quality assessment and assurance provide to the final outcome of health? Apparently this question has been raised by many. As Palmer (63) noted, at present health delivery organizations spend less money and time on quality assessment than industrial organizations. Apparently, the administrators and practitioners in these organizations are reluctant to divert funds from direct patient care to quality assessment because, "they lack conviction that dollars spent on QA yield commensurate benefits to patients" (64).

Palmer and Nesson (65) base their skepticism of medical care evaluations on the fact that there have been few published reports describing corrective actions implemented following an evaluation and even fewer reports are available documenting any improvement in patient care. They further question the benefit which can be gained from a mandated medical care evaluation program as compared to the success achieved by sophisticated and well-motivated providers.

Palmer also conducted a study on the benefits of quality assessment with a group of researchers from the Harvard School of Public Health. They found that quality assessment and feedback had the greatest impact on individual provider practices; however, areas addressing coordination of patient follow-up were not affected (66). Although aspects of the study design were not clarified, these results have serious implications for the administrator as a large portion of the responsibility for follow-up coordination procedures rests with the administrator.

More recently, Payne and associates have published results from a study

in which they conducted evaluations of ambulatory medical care and implemented a variety of actions designed to identify the more effective method of improving the care. They concluded, "that significant improvements in physician performance followed both changes in clinic management and intervention through seminar and seminar/follow-up" (67). A graphic demonstration of the results is presented in Figure 3. Fortunately, these results challenge Palmer's and provide the administrator with a justification for active involvement in the quality assessment and assurance process.

In addition to the evidence that management actions can influence the quality of care, the basic professionalism of the administrator provides a motivation to insure quality care is provided. Finally, as "guardians" of the significant portion of economic resources society has allocated to the health care system, administrators have a responsibility to insure appropriate utilization of these resources and that a quality "product" is produced (68).

Although most administrators respond to the "call of professionalism" in the quality assessment process, regulatory agencies have established guidelines and standards for the quality assessment process. To gain a historical perspective on medical care regulation, one must realize that care providers have come under scrutiny almost since they came into existence. Even physicians in 1100 B.C. Egypt were regulated by law as to the nature and extent of their practice (69). The most significant regulatory changes dealing with the quality of care issue have only occurred in the past eighty years. The Flexner report of the early 1900's spurred society to respond to a situation long in need of attention. Since that time, the Joint Commission for the Accreditation of Hospitals (JCAH) has been established, and, with the passage of Medicare legislation, professional review organizations have been

# Impact of Various Interventions on the

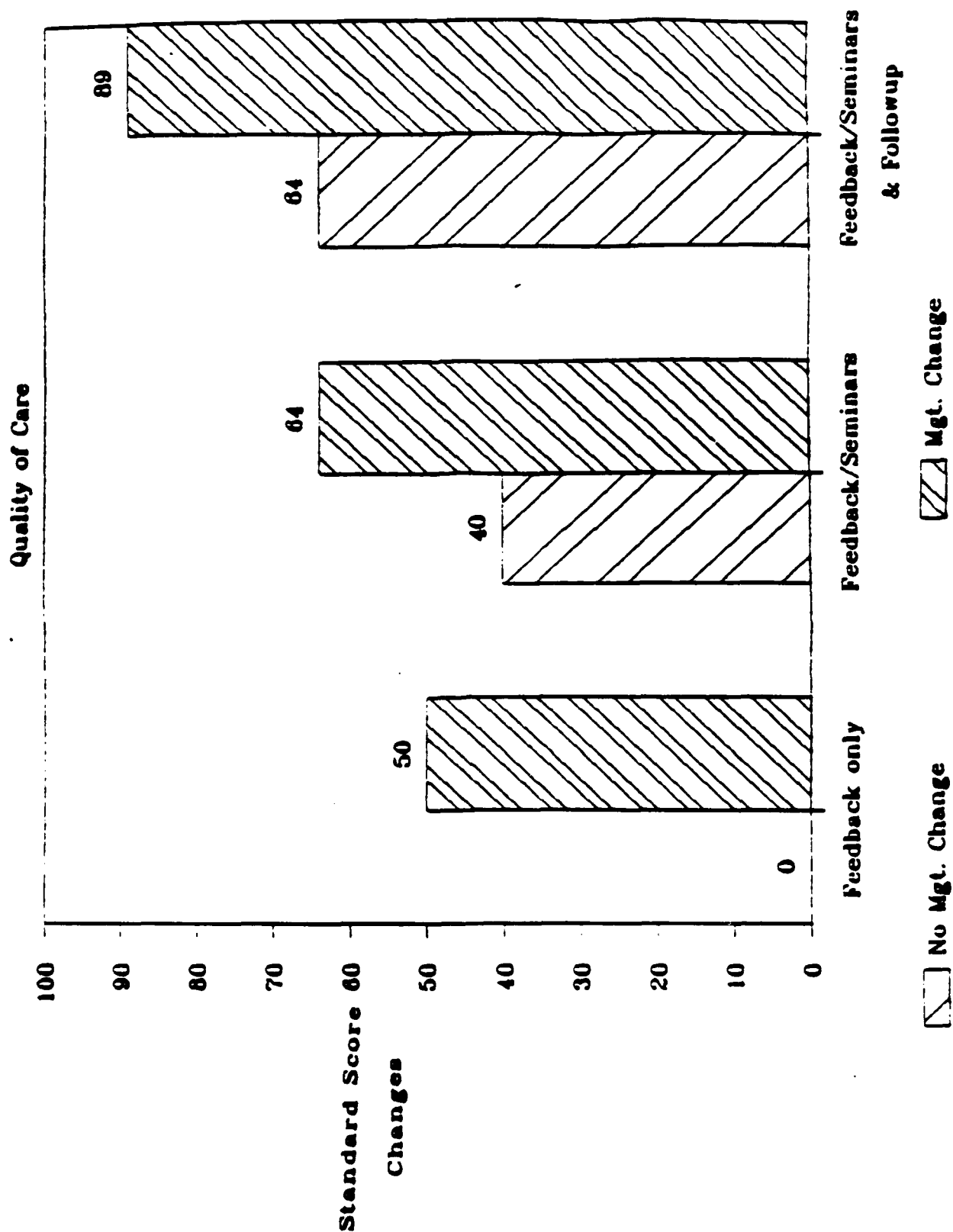


FIGURE 3

created (70).

Of primary concern to the ambulatory health care provider and administrator are the JCAH standards (71,72). Specifically addressing the medical care assessment process, the JCAH states there must be,

... an ongoing quality assurance program designed to objectively and systematically monitor and evaluate the quality and appropriateness of patient care, pursue opportunities to improve patient care, and resolve identified problems (73).

The JCAH further clarifies this standard by specifically identifying necessary medical staff functions, service evaluations, hospital-wide functions, as well as information collection, criteria development, and problem resolution. Of greatest concern to the administrator, of course, are the features of the treatment system under his/her direct control. The administrative staff is specifically mandated by JCAH to maintain an ongoing collection and evaluation of information; develop appropriate criteria; and improve patient care or resolve problems through actions taken (74).

In addition to the JCAH requirements, military health care providers and administrators are specifically required by Army Regulation (AR) 40-66 to assess patient care through a review of medical records and other appropriate sources (75). A committee review process is to be established and populations, criteria, and standards or goals specified as directed by the regulation. Locally, Brooke Army Medical Center (BAMC) Memorandum 40-118 establishes the quality assurance program for this command. Included in the local program are mechanisms for concurrent and retrospective reviews; the establishment of criteria and standards; the integration of various functional areas throughout the center; and the important quality assurance components of patient care assessment, risk management, utilization review,

and credentialing (76).

The importance of these regulatory standards, mandates, and guidelines is clear. For the dynamic administrator desirous of insuring his/her input or contribution to the treatment encounter process is effective, efficient, and of high quality, these directions provide a framework, a "structure" to use Donabedian's term, from which an individualized quality assessment program can be developed.



## OPERATIONALIZATION OF THE CONCEPT

To this point, a theoretical basis for quality assessment has been established, important terms and concepts have been defined, and the purposes for conducting assessments have been clarified. It is time to transition completely to the operational. Given all of the prior information, how can an administrator develop a quality assessment program? Unfortunately, in the search for the answer to this final question, the administrator finds his/her journey has only been half completed by the preceding arduous trek through concepts, theory, and terminology. What follows is not necessarily prescriptive, but certainly provides a framework for the development of individual programs.

Williams and Torrens (77) advise that the purpose and target of the quality assessment be clearly specified at the start of the process. Utilizing the previously discussed systems model, it can be broadly deduced that the administrator's purpose in quality assessment is to insure the efficiency, effectiveness, and responsiveness of the inputs under his/her control. Obviously the target of the assessment is the input; however, some decision making and selection must occur to identify those inputs with the greater impact on the process and final outcome. Although this is simply stated, in actuality this identification process may prove difficult. It is important to insure that the study focus is relevant and valid for the assessment process. A number of methods to accomplish this task have been identified (78-82). These methods range from utilizing historical and/or published data and regulatory standards to various group consensus finding techniques such as the Delphi technique, the focus group, the nominal group, and brainstorming. Patient feedback and surveys are also cited as important

and valuable sources of information in the identification of the assessment purpose and target.

Rowland and Rowland (83) recommend further aspects of the assessment process also be clarified before the journey is resumed. Many of the previously mentioned techniques can be utilized to narrow the focus of the assessment in these areas. Specific decisions which must be addressed include the following areas (84).

- The scope of the study (general or specific).
- The setting or service to be studied (one or several).
- The aspect of quality to be studied (one or several; technical or interpersonal).
- The patient focus of the study (individual, group, or population).
- The time frame of the study (retrospective, concurrent, or prospective).

After these points have been clarified, a good portion of the "structure" of the assessment process has been established. However, the portion remaining has been one of the most widely discussed features of the assessment process' "structure". Donabedian spends a great deal of time discussing the concept of "criteria". Criteria is defined as, "the phenomena that one counts or measures in order to assess the quality of care" (85). In order to assess the care based on the criteria, Donabedian offers the concepts of "norms" and "standards". Norms are defined as, "the general rules that indicate what goodness is" and accordingly, standards are defined as, "the precise count or quantity that specifies an adequate, acceptable, or optimal level of quality" (86).

In an effort to clarify the concept of criteria for the practitioner or

administrator, Donabedian has identified the classifications of "implicit" or "explicit" criteria (87). Implicit criteria refers to an "expert" practitioner's judgement of the quality of care provided (88,89). Explicit criteria, on the other hand, are clearly specified with logical progressions to the final assessment. Items to be judged and the weights assigned to each item are specifically identified with the explicit criteria. Although there may be exceptions, most assessments of the administrative inputs rely on explicit criteria.

There are definite advantages to the use of explicit criteria in the assessment process. Explicit criteria tend to produce predictable, consistent, fair, and valid judgements about the quality of care. This type of criteria also tends to be simpler to apply, less expensive, less time consuming, and verifiable (90). However, the administrator in search of "the answer" must also be aware of the limitations of explicit criteria (91,92). The focus of explicit criteria must be narrowly defined to keep the assessment within practical limits. Explicit criteria are also open to "obscurantism" (93) and can become sources of institutionalized error. In summary, Donabedian (94) states,

The greater amenability of explicit criteria to use as an instrument of control is also a two-edged sword. In this capacity, their utility and their dangers stem not only from their design, but also, and more importantly, from who uses them, in what way, and for what purpose. Properly constructed and used, explicit criteria can expand the definition of quality and raise its level. Improperly used, they can impose an oppressive and misguided uniformity, assuming the professions allow themselves to be so dominated.

Donabedian (95) puts great emphasis on the replicability, stability over

time, relevance, and validity of the criteria. The process of identifying and defining the criteria must be carefully conducted to insure appropriate criteria are developed. Many of the previously discussed identification techniques are applicable and have been used with good success in the development of assessment criteria (96). For a more practical approach to criteria development, Rowland and Rowland recommend use of the California Medical Association and California Hospital Association guidelines (97). They state the criteria should meet the following requirements.

- **Relevant.** Each criterion must be specifically related to the objective of the study.

- **Understandable.** Each criterion may be written in specific medical terminology, but must be worded explicitly as a complete statement to eliminate any misunderstanding.

- **Measurable.** Each criterion should include the time frame of the activity, the frequency of the activity and/or the specific range of test data expected.

- **Behavioral.** Each criterion should be indicative of the activity of a specific group of practitioners or patients in order to identify what or whose behavior should be changed.

- **Achievable.** Each criterion should be realistic given the present state of art, the local patient population, and the hospital staff's capabilities.

Once the criteria are established, the exact measurement and identification of acceptable levels must be addressed in the development of the standards. Again, the previously discussed techniques are very applicable in identifying appropriate and achievable standards for the criteria.

In order for the assessment to be completed, certain methodological

considerations must be addressed. Of particular importance are the data sources to be used. Numerous sources have been identified (98-102) and include direct observation, direct interviews, medical records, patient surveys, internal screening mechanisms, statistical reports, patient complaints, medical claims, and survey results of various external inspection agencies. Sampling procedures and the assessment period or intervals must also be defined. The choice of data sources and patient sampling, as with the purpose, population, criteria, and standards identification, must be based on local needs and resources and be consistent with the medical system (103).

Having established the basis for the operationalization of quality assessment in general, the applicability of this basis to the ambulatory health care setting must be examined.

## AMBULATORY HEALTH CARE ASSESSMENT

The ambulatory health care setting has many unique characteristics which impact on the quality of care provided. Problems with coordination, data systems, the lack of outcome standards, and the active role of the patient in the treatment process have been noted by many (104-106) and can significantly limit the quality assessment effort. Features of ambulatory care and their consequences for quality assurance are summarized in Table 1.

Armed with the awareness of the special problems of the ambulatory health care setting, the quality-minded administrator is now prepared to select a method to assess the quality of his/her input into the healing encounter.

Many of the historical quality of care evaluation techniques have addressed provider performance and competence. Provider based studies involve either sampling selected aspects of care given by all practitioners or sampling all of the care provided by a few providers. Alternatively, a sample from a large group of patients may be selected regardless of diagnosis or provider to determine if appropriate care has been received (107).

The use of sentinel health events (108) as an indicator of the quality of care has increased over the past few years. The "sentinel health event" assessment method is an outcome based approach which utilizes the occurrence of such events as preventable diseases, avoidable complications, and untimely death as warning signs of suboptimal care. This is one of the techniques which has been implemented on a Department of Defense wide basis as a retrospective and concurrent screening mechanism (109).

The Comprehensive Quality Assurance System from Kaiser Permanente

TABLE 1  
CHARACTERISTICS OF AMBULATORY CARE

Features of Ambulatory Care*	Quality Assurance Implications
<p>Sources of care are scattered in place and time.</p> <ul style="list-style-type: none"> <li>-Need for both interaction with other agencies and coordination over time.</li> <li>-Lack of common record for all providers.</li> <li>-Professional isolation.</li> </ul>	<p>Systems failures are both common and hard to document. There are methodological problems for evaluations. Feedback loop is hard to organize.</p>
<p>Provider role is distinctive.</p> <ul style="list-style-type: none"> <li>-First contact.</li> <li>-Longitudinal relationship.</li> <li>-Integrationist function.</li> </ul>	<p>Ambiguity about the task must be resolved in order to complete the feedback loop. There is a lack of a clearly defined unit of care about which an assessment can be made.</p>
<p>Content of practice is distinctive.</p> <ul style="list-style-type: none"> <li>-High incidence of acute self-limited disease.</li> <li>-High prevalence of chronic disease.</li> <li>-High prevalence of psychosocial components.</li> <li>-High prevalence of well persons.</li> <li>-Early presentation of serious disease.</li> </ul>	<p>Signal-detection problems are prominent. Outcome measures are difficult to specify. Acceptability and interpersonal skill component of provider competence are of special importance.</p>
<p>Conventional wisdom of medicine is less well established by research.</p>	<p>Process is difficult to specify.</p>
<p>Natural history of conditions, over the long span of ambulatory care, is seldom well defined.</p>	<p>Outcome standards for comparison are not available.</p>
<p>Patient's role is more active.</p>	<p>Accessibility and provider's skill in securing compliance have special importance.</p>
<p>Cost is usually borne directly by the patient.</p>	<p>Trade-offs between cost and quality may affect access and choice of methods for evaluation.</p>
<p>Management and data systems are poorly developed.</p>	<p>Systems required for most existing QA programs are often not in place.</p>

\*\*\*\*\*  
 \*These features apply to ambulatory care in general (civilian and military).  
 From: R. Heather Palmer, Ambulatory Health Care Evaluation: Principles and Practice. (Chicago: American Hospital Association, 1983), p. 42.

utilizes the technique of microsampling (110-114) in which providers review a small number of charts to identify and prioritize problems. Based on the identified problems, standards are established and a chart audit is done to compare the charts to the standards. Charts failing to meet the standard are subject to peer review, corrective action, and re-assessment. This method is preferable to the retrospective chart reviews of patient care in the medical audit as it not only assesses the patient care but also provides a method of assuring the quality of care (115).

Profile analysis is another widely used technique involving a retrospective review of aggregated patient care data for patterns or trends over a defined period of time. There are three basic types of profiles: patient, practitioner, and institution. The developed profiles are not only valuable in the utilization review process but also in general planning activities such as resource allocation and justification (116,117).

Use of the "staging concept" assessment technique has also increased in recent years and is specifically applicable in the assessment of ambulatory health care. The basic premise in this outcome based technique is that the seriousness of the patient's condition at any point in the treatment process is a good indicator of the quality of prior care. Ambulatory care is assessed by this method utilizing the inpatient records. This technique is particularly useful because the ambulatory health care setting, as previously noted, frequently experiences difficulties with medical records (118-120).

The "tracer method" examines the process of care and can be applied to a wider range of outcome criteria. Kessner and associates (121) developed this method specifically to assess the functioning of the health care system for a given population. "Tracers" are specific health problems for the population. The medical problems are "traced" through the medical care system from



diagnosis to outcome to assess the quality of all care and components of care. The advantage of the tracer method and the assessment of the episode of illness is that it reviews the whole treatment process. However, disadvantages to this method have also been noted. The method does not include a random chart review to identify mis-diagnoses and the tracking process may prove costly and time consuming (122-127).

A "spinoff" of the tracer methodology has been adopted in some facilities with the development of special systems to insure patient schedules for screening, treatment, and follow-up are completed. Periodic scanning of these areas can provide a quick assessment of the effectiveness and efficiency of specific system areas (128). Although this method appears most applicable for the administrator, no published reports on its efficacy could be located.

Although aspects of the military health care delivery system are unique, most quality assessment efforts have utilized established civilian models. At present, three broad categories of assessment are used at BAMC (129). These methods include: 1) document based reviews of medical records, incident reports, financial data, and statistics; 2) direct observation of clinical performance of the system and/or patient; and 3) surveys and interviews with staff and/or patients. No specific mention of the use of the tracer methodology or its "spinoff" in quality assessment and assurance in the military health care delivery system could be found.

In view of the absence of a mechanism to specifically assess the quality of administrative functions on a system wide basis, a variation of the tracer methodology and its "spinoff" is proposed. This assessment mechanism can be classified under the "direct observation" of the system's administrative components as mentioned above. The tracer variation starts not with a

patient problem or diagnosis, but rather with the practitioner's orders. These orders may include laboratory tests; radiologic examinations; pharmaceutical orders; referral orders; or return appointment orders. The orders themselves are tracked through the system to assess the responsiveness of the system to the order and to assess the system's ability to complete the order. The assessment indicates the efficiency and effectiveness of such administrative concerns as the scheduling system, the distribution system, the medical records section, clinic management, the interpersonal skills of staff and the appropriateness of resource allocations. The important component of patient compliance must be included in the assessment to more specifically identify system shortcomings.

In summary, the administrator's journey has taken him/her along a winding/twisting path to the concept of quality and its components; past an administrator's systems theory model of the health care delivery process and quality assessment; through a forest of criteria, standards, and norms; to a multitude of methods. At this point, the administrator must gather the tools he/she has found to determine the functionality of these tools in his/her quest for a method of assessing and assuring quality administrative inputs enter the health care delivery system. This "gathering of tools" is the basic purpose of this study in the hopes of finding the proposed "tool" of the tracer variation is functional and appropriate for the administrator.

### III. RESEARCH DESIGN

#### OBJECTIVES

1. Perform a literature search on basic quality assurance issues and evaluation techniques which may be applicable to the administrator.

2. Identify specific methods of tracking ordered tests, examinations, services, referrals, and return appointments.

3. Pre-test these methods to insure the feasibility of the tracking process.

4. Target primary ambulatory care clinics for tracking.

5. Establish acceptable levels of treatment order accomplishment at BAMC based on a practitioner survey.

6. Assess system responsiveness to ordered treatment regimes and, therefore, the quality of specific administrative functions by:

a. Determining the minimum sample size required to make inferences about system responsiveness to each targeted clinic's practitioner orders.

b. Collecting data by tracking laboratory requests, radiographic examinations, referrals, and return appointments through the hospital system.

c. Identifying areas of apparent system non-responsiveness which may be attributed to patient non-compliance.

7. Assess those patients identified as possibly non-compliant to identify reasons for non-compliance by:

a. Developing and administering a telephonic survey to all patients identified as possibly non-compliant.

b. Collecting and collating the data obtained from the survey.

8. Perform statistical analyses on the results of the practitioner survey, the system tracking, and the patient survey to identify areas of system failure and patient non-compliance.

9. Discuss causes of administrative system failures and patient non-compliance and recommend any changes to improve the coordination, effectiveness and efficiency of BAMC's ambulatory health care delivery system.

### ASSUMPTIONS

For the purposes of this research, it was assumed that:

1. The existing information system would be able to support the study.
2. The resources to conduct the study were available.
3. Assessment of system and patient responsiveness would allow formulation of conclusions about the quality of selected administrative "structural" and "process" aspects of this ambulatory health care delivery system.
4. Documented provider examination and treatment orders reflected appropriate, state-of-the-art care.
5. The practitioners surveyed to establish acceptable levels of order accomplishment would be motivated to complete the questionnaire and provide accurate responses.
6. The individuals responding to the telephonic survey would be interested in improving system functioning and therefore, respond honestly to the questions.
7. The samples of patients selected from each clinic would be

representative of each clinic's care recipient population.

8. In the absence of the medical record, appointments made in the specialty clinics of general surgery and dermatology within a sixty day period following the initial appointment would represent the return appointment ordered by the practitioner.

9. In the absence of the medical record and evidence of any other treatment encounter, radiographic examinations recorded in the TRIRAD data base within one week of the initial treatment encounter would represent the examination ordered by the practitioner.

10. Laboratory examinations would be completed within seven days of the initial order unless otherwise documented in the medical record.

11. Referrals or return appointments would be scheduled within sixty days of the initial order unless otherwise documented in the medical record.

12. Documentation of all care provided, including the initial visit; completed laboratory tests; special procedures; and referral examinations or treatments would be filed in the medical record within one month of the date the care or test was provided.

#### CRITERIA

1. Clinics targeted for the tracking analysis were main entry points or referral clinics for the health care system. Target clinics were:

- a. The Troop Medical Clinic
- b. The General Surgery Clinic
- c. The Dermatology Clinic
- d. The Pediatric Clinic

2. The sample size from each of the target clinics is large enough to insure a 95% confidence level. The desired interval equaled 20% ( $d^2 = .1$ ).

3. Any point in the tracking process receiving scores significantly (2 standard deviations) below the established acceptable levels of order completion based on the responses to the practitioner survey is considered an area of potential system failure.

4. Statistical analyses of the collected practitioner, system, and patient data were performed at the .05 level of significance.

5. The recommendations to improve the efficiency and effectiveness of the health care delivery system are in consonance with the established goals and objectives of BAMC.

### LIMITATIONS

The following constraints were operative during this study:

1. The study only examined orders generated from the selected BAMC ambulatory care clinics.

2. Referral clinics were limited to those clinics presently served by the BAMC Central Appointment System (Appendix A).

3. The study only examined specific areas recorded on the Performance Measurement Study Ambulatory Care Data Base Outpatient Encounter Form (Appendix B).

4. The study covered a four month time frame.

5. Data provided by established automated systems (i.e. TRIPAS and TRIRAD) was accepted and used as provided.

6. Attempts to contact the patient or responsible family member for

administration of the patient compliance survey did not extend beyond a two week period. This time period was seen as practical and appropriate for purposes of this study and was not anticipated to be a weakness in the study results.

### DEFINITIONS

1. SYSTEM RESPONSIVENESS: The ability of the system to carry out the ordered treatment regime. System responsiveness will be demonstrated within sixty days. The system was considered responsive based on:

- a. The availability of an appointment.
- b. The ability of the clinic or service to complete requested service or treatment (e.g. resources availability in terms of manpower, materiel, time, skills, etc.).
- c. The documentation of orders and provided services or treatments in the medical record.

2. RECIPIENT RESPONSIVENESS: The ability or motivation of the recipient or responsible family member to complete the ordered treatment regime. Recipient responsiveness will be demonstrated within sixty days after the treatment or service is ordered. Recipient responsiveness involved:

- a. The ability and/or motivation to contact the central appointment system.
- b. The ability and/or motivation to have ordered tests and procedures completed.
- c. The ability and/or motivation to report to the referred clinic or service on the appointed day.

3. ACCURACY: The complete replication of information on the Performance Measurement Study Ambulatory Care Data Base Outpatient Encounter Form and the medical record and/or available data bases (TRIPAS and TRIRAD).

## **METHODOLOGY**

### **PRE-TEST**

A pre-test was conducted by tracking five patients from each of the identified target clinics through the ordered treatment regimes to insure feasibility of the study.

### **ESTABLISHMENT OF ACCEPTABLE LEVELS OF ORDER ACCOMPLISHMENT**

1. A survey tool was developed to establish acceptable levels of order compliance for the target clinics. The survey addressed the areas of return appointments, referrals, laboratory, and radiographic orders. The survey tool is included in Appendix C.

2. The survey tool was reviewed by the Deputy Commander for Administration, the Deputy Commander for Clinical Services, and the Chief, Department of Nursing for approval and any modifications required.

3. The survey was administered to all of the practitioners in the target clinics.



4. Results of the survey were compiled to establish an aggregate level of acceptable order accomplishment based on the calculated means and standard deviations.

5. The results of the survey were also differentiated by clinic in order to establish individual clinic acceptable order accomplishment levels based on the calculated means and standard deviations.

## **SAMPLING**

1. A random sample from the patients identified on the Ambulatory Patient Care Data Base Form as requiring the previously specified services, treatments, or appointments was drawn with replacement for each clinic for the months of January and February 1986.

2. Sample sizes for each clinic over the study period were based on the minimum sample size determination formula:

$$n = \frac{(z^2)(p)(q)}{(d^2)}$$

Where:  $n$  = sample size

$p$  = Estimate of the true proportion of order accomplishment and documentation; since this estimate was unknown, 0.5 was used to obtain the largest sample for the desired reliability and interval width.

$$q = 1 - p = 0.5$$

$z$  = value used for a 95 percent confidence interval (1.96).

$d$  = the acceptable width of the difference of the true proportion; in this case, plus or minus 0.1 was used.

$$\text{Therefore, } n = \frac{(1.96^2)(.5)(.5)}{(.1^2)} = 96.04$$

3. To attempt to eliminate potential differences in system and patient responsiveness for the available and non-available medical record groups, record requests were submitted twice and all possible record rooms were included in the record request process. Furthermore, available information systems (TRIPAS and TRIRAD) were utilized to demonstrate order accomplishment in the absence of the medical record.

## **EVALUATION OF SYSTEM RESPONSIVENESS**

### **DATA COLLECTION**

Data was collected from the following sources in the following order. The tracking process is illustrated in Figure 4.

1. The various record sections to determine the availability of the medical record.

- a. "0" indicates the record was not available.
- b. "1" indicates the record was available.
- c. "2" indicates a temporary record was available.

2. The medical records to ascertain if the requested services or referrals were documented by the ordering practitioner.

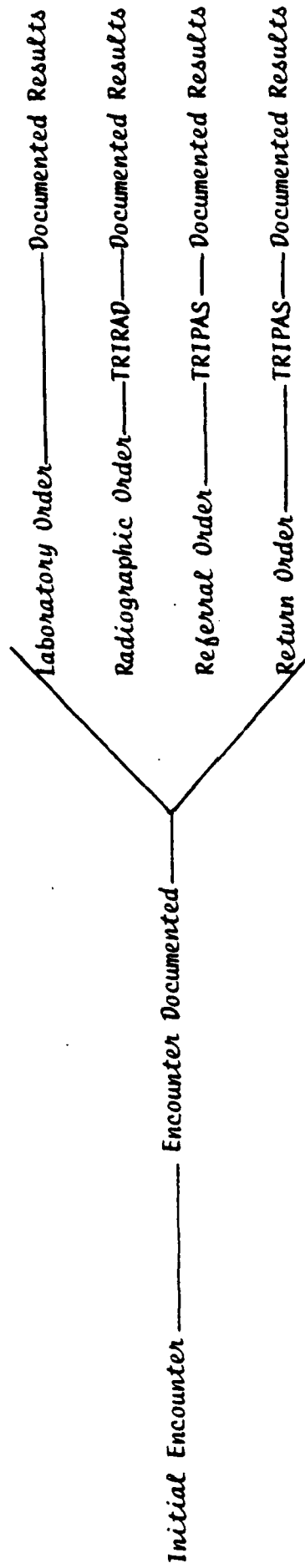
- a. "0" indicates the orders were not documented.
- b. "1" indicates the orders were documented.

3. The Central Appointment System to ascertain if an appointment was scheduled (if needed) within 60 days.

FIGURE 4

"ORDER TRACERS"

STUDY TRACKING PROCESS



- a. "0" indicates the appointment was not scheduled within 60 days.
- b. "1" indicates the appointment was scheduled within 60 days.
- c. "2" indicates a return appointment or referral was not required.
- d. "3" indicates that appointments have been scheduled; however, in the absence of documentation, it is not known if the appointment represents the ordered return or referral appointment.

4. If the order for a return visit or referral specifies a time frame, the Central Appointment System data was reviewed to ascertain if the appointment was within one week of the specified time.

- a. "0" indicates the appointment was not within one week of the specified time.
- b. "1" indicates the appointment was within one week of the specified time.
- c. "2" indicates a return appointment or referral was not required.
- d. "3" indicates the time frame was not specified or known.

5. The referral or ancillary support clinic or service to ascertain if the patient received the required treatment, examination, or service.

- a. "0" indicates the patient was not treated.
- b. "1" indicates the patient was treated.
- c. "2" indicates the treatment was not required.
- d. "3" indicates the treatment status is not known in the absence of the medical record.

If the patient was not treated, the central appointment system or the clinic was checked to ascertain if the appointment was missed or cancelled.

- 1. "0" indicates the appointment was missed.
- 2. "1" indicates the appointment was cancelled.

6. The medical records to ascertain if the referral or service report was filed within 30 days of the treatment, examination, or service.

a. "0" indicates the report was not present.

b. "1" indicates the report was present.

7. Additionally, variables were derived to indicate overall compliance with each type of practitioner order.

a. Return Compliance

1. "0" indicates there was no compliance with the order.

2. "1" indicates compliance can not be determined in the absence of documentation.

3. "2" indicates partial patient compliance - an appointment was scheduled; however, the patient either missed or cancelled the appointment and has not rescheduled.

4. "3" indicates partial system compliance - the follow up visit was completed; however, documentation of the encounter could not be found.

5. "4" indicates full compliance with the order - the follow up was completed and documented.

b. Referral Compliance

1. "0" indicates there was no compliance with the order.

2. "1" indicates compliance can not be determined in the absence of documentation.

3. "2" indicates partial patient compliance - an appointment was scheduled; however, the patient either missed or cancelled the appointment and has not rescheduled.

4. "3" indicates partial system compliance - the referral visit was completed; however, documentation of the encounter

could not be found.

5. "4" indicates full compliance with the order - the referral visit and/or treatment was completed and documented.

c. Radiologic Examination Compliance

1. "0" indicates there was no compliance with the order.

2. "1" indicates compliance can not be determined in the absence of documentation.

3. "2" indicates partial system compliance - the examination was completed; however, documentation of the results could not be found.

4. "3" indicates full compliance with the order - the examination was completed and documented.

d. Laboratory Examination Compliance

1. "0" indicates there was no compliance with the order.

2. "1" indicates compliance can not be determined in the absence of documentation.

3. "2" indicates full compliance with the order - the examination was completed and documented.

## EVALUATION OF RECIPIENT RESPONSIVENESS

### 1. SURVEY DEVELOPMENT

a. A survey tool was developed to identify the factors contributing to the patient's apparent noncompliance. The survey tool is included in Appendix D.

b. The survey tool was reviewed by the Deputy Commander for Administration, the Deputy Commander for Clinical Services, the Chief,

Department of Nursing, and the chiefs of each identified target clinic for approval and any modifications required.

c. The survey tool was pre-tested with a random sample of twenty patients identified as having missed a scheduled appointment by the Central Appointment System.

d. Feedback was requested from the pre-test sample on the clarity of the questions as well as the length and design of the survey.

e. The results of the pre-test were utilized in the design of the final survey tool.

## **2. DATA COLLECTION**

a. The survey population consisted of 100 percent of those patients receiving unresponsive ("0") scores in the following areas tracked under "System Responsiveness":

1. The Central Appointment System - the appointment was not scheduled within 60 days.

2. The referral or ancillary support clinic or service - the required treatment, examination, or service was not received within the specified time frame from the receipt of the order or appointment.

b. The final survey was administered within 90 days of the initial provider order. Attempts to contact the patient or responsible family member were made at various times over a two week period.

## **EVALUATION OF ACCURACY**

Data was collected to determine accuracy as previously defined using dummy variables.

1. "0" indicated the data was not completely replicated.
2. "1" indicated complete data replication.

## **DATA ANALYSIS - SYSTEM RESPONSIVENESS**

1. The total "0" and "1" dummy variables for each point in the tracking continuum were summed and percentages for each dummy variable at each point were calculated.

2. The relative percentages of the dummy variables for the entire tracking continuum were calculated to indicate overall system and recipient responsiveness.

3. The relative percentages of the dummy variables for the tracking continuum were calculated for each identified target clinic to indicate responsiveness to a specific clinic's system support needs.

4. These percentages were compared to the previously established acceptable levels of order accomplishment to determine if there was significant deviation from acceptable levels.

a. The null hypothesis for this analysis was there are no significant differences between the observed levels of order accomplishment and the established acceptable levels of accomplishment.

b. Significant differences were determined by establishing a 95% confidence interval based on the calculated means and standard deviations.

c. This analysis was completed for each type of order for all clinics as an aggregate and for each individual clinic.



5. Additionally, the relative percentages of the dummy variables were calculated for the following independent variable groups.

a. Recipient age:

1. 0 - 18;
2. 18 - 40;
3. Over 40.

b. Recipient status:

1. Active Duty;
2. Dependent of Active Duty member;
3. Retired;
4. Dependent of Retired member.

c. Sponsor status:

1. Officer
2. Enlisted

d. Record availability:

1. Records available
2. Records unavailable

#### **DATA ANALYSIS - RECIPIENT RESPONSIVENESS**

1. Relative percentages were calculated for all of the survey items except for age. The age data was grouped into the three categories previously identified. The percentages for each response were calculated and analyzed for potential trends or general agreement.

2. Responses to the open ended question, "suggestions for improvement" were also analyzed for potential trends or general agreement and were

utilized in the final application of results.

#### **DATA ANALYSIS - ACCURACY**

The percentage of complete data replication was calculated for each clinic and as an aggregate to indicate data accuracy. Areas of inaccuracy were documented as they were identified for analysis of possible trends and were utilized in the final application of results.

#### **ANALYSIS OF GROUP DIFFERENCES**

1. Further analysis was completed to examine any significant differences in system and/or recipient responsiveness for the following previously identified independent variable groups:

- a. Age;
- b. Recipient status;
- c. Sponsor status;
- d. Originating clinic;
- e. Record availability.

2. The null hypothesis for these analyses was that there is no significant difference between the identified variable groups in terms of system and/or recipient responsiveness. This included all of the system components examined. All statistical analyses were performed at an .05 level of significance.

3. A series of Pearson Chi-square tests of independence were performed

to identify any relationship between each independent variable group and the dependent system and recipient responsiveness variables.

4. Additionally, differences between originating clinics in terms of data accuracy were examined utilizing a Chi-square analysis.

5. Goodman and Krushal's Lambda was utilized to determine the magnitude of those relationships identified as significant by the Chi-square analyses.

6. Responses to the practitioner survey were examined to identify any differences between clinics by performing an Analysis of Variance.

## IV. DISCUSSION

### TOOL FEASIBILITY

The results from the study including the relative frequency data, the Chi-square analyses, the comparison of compliance data with physician expectations, the analyses of differences in physician expectations by clinic, and the results of the patient compliance survey are summarized in Tables 2 to 6 (Appendix E).

The primary purpose of this study was to assess the feasibility of the tracking mechanism as a method to directly and indirectly evaluate some administrative inputs into the health care delivery process. The advantages of this method are clear. The evaluation does not solely address the practitioner skills, competence, and decision making, rather it views the system more as a whole and assesses the responsiveness of system components. This sort of assessment mechanism appears, in theory, to be the most appropriate one for the administrator to assess his/her control of inputs (e.g. the management of resources, personnel, planning and marketing issues, etc.) into the system. As the administrator's primary purpose and the justification for his/her presence in the organization is the control of these inputs, evaluation of these functions should be a concern of all administrators.

Based on the results of the study, it must be concluded that, although the tracking method appears to be very applicable, it is not an effective evaluation tool at this time. The potential for this mechanism to be time consuming was certainly realized in this study. Data had to be collected

from many sources and these sources had to be consulted several times to insure the accuracy of the data. This mechanism is too time consuming due to limitations in the present information systems to be a functional tool for the administrator. In addition, the quality of the available data is less than optimal. A relatively large number of the responses for many areas in the tracking process was "unknown." Specifically, no valid conclusions could be made in the areas of accuracy (46.3% unknown); referral appointment status (29.5% unknown); return appointment status (17.8% unknown); follow up appointment attendance (19.5% unknown); return appointment compliance (20.1% unknown); and referral compliance (34.2% unknown) (Table 2).

## MEDICAL RECORDS

The large number of unknown responses can be attributed to the significant non-availability of medical records. Most of the results are skewed significantly by the absence of documentation. The patient and system may actually have accomplished the order in many cases; however, without adequate documentation, no conclusion can be made. The maintenance of the medical record is a primary responsibility of the administrator. The significant absence of medical records is certainly reflective of this aspect of the administrative inputs into the health care delivery process.

The medical record is a critical element of the health care delivery process. Although practitioners often complain about the "tedious" and "bureaucratic" paperwork required of them, interfering with their more pressing patient care responsibilities, it must be realized that the medical record is essential for evidence of quality of care and for the previously discussed continuity of care (130-132). Kovner (133) references the American Hospital Association in her discussion of the primary purposes for medical records. She states the medical record provides the following important contributions.

1. The medical records serves as a means of communication among practitioners caring for the patient.
2. The record is a source of data for present and future research.
3. It also provides a record of how the patient responded in the past as a guide for future treatment.

The importance of the medical record in the quality assessment and assurance process has been widely recognized. Gillette (134), in his discussion of medical records, stated, "in hospitals, and increasingly in ambulatory sites,

clinical records are also used to measure the quality of care given patients."

It must be acknowledged that the maintenance of the ambulatory care medical record is particularly difficult due to many of the previously discussed features of this setting. As Palmer (135) stated, "ambulatory care records are notoriously less satisfactory as a data source." Payne (136) also encountered difficulties with the record in her study of methods of assessing and improving ambulatory care. She stated, "ambulatory records do not lend themselves to accurately defined diagnostic coding or to ready accessibility." She reported record availability for her study ranged from 57 to 65 percent. She also cited other studies which reported record availability of 68, 67, 65, and 20 percent (137). Utilizing these figures as a basis for comparison, the record availability in this study (47%) is relatively lower than the norm and appears to indicate a more serious problem in this setting when compared to other health care delivery organizations.

A recent study conducted at BAMC indicated two major factors contribute to the problem of record non-availability (138). Individual beneficiary mistrust of the record keeping mechanism is problem which pervades the entire military health care delivery system. This mistrust causes a large number of patients to maintain their own records. Continuity of care is disrupted with this practice as referral, test results, and reports may be filed in several different records.

The inherent difficulties with the physical structure of BAMC have a significant impact on this system's ability to properly maintain records. Due to the dispersed nature of its operations, BAMC currently operates three separate record rooms. Records must be transported to numerous BAMC clinics at various location around Fort Sam Houston. Although the distribution

system is elaborate and relatively successful, the large number of "players" (e.g. record rooms, clinics, etc.) in the system significantly increases the possibility of misplaced records.

It is possible that the presence of the record room in the clinic primarily responsible for a patient's care reduces the potential for misplaced records. The Pediatric clinic results support this idea with the largest number of available records (Table 2). However, the difference in available records between clinics (excluding the TMC) was not significant (Table 3). The TMC record availability results (69% non-available) appear to refute the idea that record room location contributes to record availability; however, a large portion of these non-available records can be attributed to the high turnover rate of TMC patients due to the short term training conducted at Fort Sam Houston. The impact of record room location is certainly an area which warrants further controlled study and which may have implications in future hospital design activities.

Although the problem with the maintenance of medical records is understandable given the unique system features, it is not excusable. As stated in AR 40-66 (139), Army medical records are the property of the Government and the Commander of the medical treatment facility is assigned the responsibility of the official custodian of the medical records. The regulation further requires an effective record identification and tracking system be in place, "the current physical location or destination of each record must be known" (140). The JCAH also requires an adequate medical record system in its standards for ambulatory health care organizations. The standard specifically requires (141).

The organization maintains a medical record system that permits prompt retrieval of information. Medical records are legible,



documented accurately in a timely manner, and readily accessible to health care practitioners.

Obviously a system which can locate or identify less than 50 percent of its medical records at any one time fails to meet the standards for medical record systems.

Of equal, if not greater concern for the administrator are the legal implications of the record availability problem. Toth (142) has been quoted as stating, "the chart is the determining factor in 80 to 85% of malpractice litigation." It is important to realize that medical records are discoverable documents and may be subpoenaed if the mental or physical condition of the patient is relevant to the suit (143). The accuracy or completeness of the record has been the determining factor in several important court decisions. Of key concern to administrators is a 1974 decision (Collins v. Westlake Community Hospital) in which the court ruled that if there is no notation of an observation, the jury may infer that there was no observation made. This may be extended to test results, treatments, and examinations. The fact that documentation for only 44 percent of the initial encounters, 41 percent of laboratory results, and 9 percent of radiographic results could be located in the medical record is very disturbing (Table 2). Any case stating these examinations were completed could be easily refuted utilizing the medical record as evidence.

Conversely, medical records can provide substantial protection from liability as seen in the 1961 case of Engle v. Clarke. The hospital in this case was not held liable as it could demonstrate compliance with the physician's appropriate orders and documentation of that compliance (144).

Results of the Chi-square analyses can provide the administrator with some assistance in his/her efforts to properly maintain medical records and

identify target groups for intervention programs. Record availability was strongly associated with the variables of age, status, and rank. Record availability was also associated with clinic; however, as previously stated, the TMC appears to have skewed the results. When the TMC was not included in the analysis, the association between record availability and clinic was not significant.

It should not be surprising that record availability is strongly associated with most of the compliance areas as documentation is an element of compliance. What is rather surprising is the significant relationship between referral/return appointment status and record availability. When record availability is used to predict appointment status for referral patients, a 42 percent reduction in error is seen (Table 3). This suggests there may actually be a difference in terms of appropriate use of the system and compliance between the patients with and without records available. Perhaps those patients with a tendency toward system abuse and non-compliance also tend to maintain their own records. This, also is an area which certainly warrants further study.

## COMPLIANCE

Of central importance to the study are the results presented in Table 4. Compliance, as previously discussed (Figure 4) involves evidence of order completion and documentation of the results, findings, or treatment received. Partial compliance was included in the analysis to more clearly define areas of responsibility. Partial system compliance indicates there is evidence of patient compliance based on automated data systems (TRIRAD and TRIPAS); however, documented evidence of order completion (i.e. system compliance) is not available. Partial patient compliance indicates an appointment was scheduled but the patient either missed or cancelled and did not reschedule the appointment. The implications of this assessment are clear. Complete compliance indicates the relative frequency in which orders are completed and documented, the optimal indication of system and patient responsiveness. With the exception of referral and radiographic compliance results for the Dermatology Clinic which were significantly skewed by the small sample size (Table 2), the complete compliance with orders consistently failed to achieve the lowest acceptable level of compliance established by the practitioner survey (Table 4). Even when the partial compliance results were included for return appointments and referral orders, less than 50 percent were shown to have achieved the established acceptable level of compliance. Even in view of the high number of "unknown" responses, the compliance results should be a serious concern for the administrator and practitioner. If it can be assumed that the accomplishment of treatment orders is reflective of quality, then the quality of care provided is in question.

Completion of the physician orders is subject to both system and patient responsiveness. As previously noted, the ambulatory care setting relies

heavily on the responsiveness of the patient in initiating and following through with treatment. System responsiveness in this setting refers to the "ease" with which orders are carried out once the patient initiates his/her response to the order. System compliance and patient compliance must be clearly differentiated. The "no compliance" responses for return appointments (23.9%) and referrals (7.9%) presented in Table 2 represent patient failures to respond to the practitioner's order. The laboratory orders' "no compliance" response, in contrast, does not accurately differentiate system and patient compliance with the order. Due to information system limitations, laboratory orders could not be tracked in the absence of the medical record. Therefore, the "no compliance" response for laboratory orders may be considered a combined patient-system failure. The radiographic order compliance section does not include a "no compliance" response due to inaccuracies in the Ambulatory Care Data Base information. These inaccuracies will be discussed in a subsequent section. In short, the primary source of non-compliance in this study was the failure to respond to practitioner's return appointment orders.

Compliance in this study appears to be associated with several factors (Table 3). The association of clinic with return appointments and laboratory order compliance appears strong, even when the previously discussed clinic association with record availability is controlled for with the elimination of the TMC. This certainly raises some questions. Is the failure to respond to the order due to the type of patient typically seen in that clinic, to the practitioners' ordering practices, or to the interpersonal skills (or lack thereof) of those practitioners? The search for possible causes for the non-compliance may even extend to differences in clinic management practices such as practitioner scheduling or appointment system management. Compliance with

return appointment orders also appears to be related to age, status, and rank although the strength of association as measured by Lambda does not appear very strong (12%, 12%, and 5% respectively).

The results of the patient survey on compliance (Table 6) can provide more information on possible trends and factor associations. The survey was only administered to those patients who could be clearly identified as non-compliant based on medical record documentation. The results of the survey can not be generalized to all non-compliant patients due to the limited sample size and the possibility of compliance differences between the patients with and without medical records available. Additionally, due to the small sample size, complete statistical analyses were not performed. Only the raw data and relative frequencies are reported. However, as limited as the data may be, potential associations are identified. Age, distance to the treatment facility, and primary means of transportation do not appear to be factors in compliance in this study. Rank also does not appear to be a factor in compliance as the relative percentages of non-compliant patients (Table 6) and the study population (Table 2) appear to be roughly equal in terms of rank. Interestingly, family members of active duty and retired represented the major source of non-compliance (81.8% combined). Since the study population consisted of 56.9% family members, a definite tendency toward non-compliance is suggested.

The Dermatology and Pediatric Clinics tended to have more non-compliance than the other clinics (54.6% and 27.2% respectively) based on the survey results. This lends support to the previously discussed differences between clinics in terms of compliance. As also previously noted, the overwhelming source of non-compliance was the failure to respond to a return appointment order.

Responses to "Reasons for Non-Compliance" tended to group in certain areas. The patient-practitioner relationship figured in the majority of the reasons. A large percentage (46.2%) of patients either expressed dissatisfaction with the practitioner or stated they had misunderstood the instructions. This clearly indicates the importance of the relationship, as previously discussed, in gaining compliance. These findings coincide with previous studies (145) which have identified one of the greatest sources of patient dissatisfaction is the amount and form of information they receive from physicians.

Becker (146) also identifies lack of faith in the practitioner as a primary cause of dissatisfaction and non-compliance. As evidence of this long standing problem, he offers a quote from Chapin (1915),

We ought not to be surprised that people do not believe all we say, and often fail to take us seriously. If their memories were better, they would trust us even less (147).

Becker further identifies three situations which can undermine a patient's confidence (148).

1. The patient may possess powerful, well-defined (albeit scientifically erroneous) health beliefs that conflict with the physician's assessment of the problem.

2. Incidents may occur during the history taking or physical workup that the patient interprets in such a manner as to weaken his/her confidence in the diagnosis.

3. Patients sometimes reject an unanticipated diagnosis too painful to accept.

Several authors have discussed the patient's "right" to non-compliance and the issue of locus of control (149-151). This "intelligent non-

compliance" is justifiable in cases of misdiagnosis or inadequate prescribing; of adverse reactions or side effects; or of patient recognition of a change in his/her condition obviating the need for continued treatment.

The problem for the administrator is that he/she lacks the medical knowledge and background to adequately determine "intelligent non-compliance". As a result, he/she must focus on methods of improving patient compliance and assume most practitioner orders are appropriate. One of the administrator's roles should be in his/her contribution to the practitioner's education about the importance of the patient-practitioner relationship. For practical guidance, numerous authors (152-158) have addressed the patient-practitioner relationship and have recommended increased sensitivity to patient needs, enlisting family and social support, reminder calls, clear instructions and follow up visits as methods of increasing patient satisfaction and compliance. In addition, physician continuity has been shown to decrease the rate of non-compliance (159-162).

For the military setting, the majority of these techniques are very applicable; however, the potential for continuity may be limited. The Surgeon General has emphasized family practitioner-type arrangements to improve continuity but the full benefit of these programs have yet to be realized. Some of the other suggestions may prove too costly to justify. Perhaps the most practical and applicable technique is to raise the "practitioner consciousness" to the importance of the patient-practitioner relationship. Follow-up, as previously discussed, is an essential element of any intervention technique and should be included in the practitioner education process.

Two more "administrative" issues of appointment scheduling and appointment reminders were cited as the causes of non-compliance in 38.4% of

the patients surveyed. These are two areas which have been specifically addressed in past studies to determine effective methods of reducing missed appointments. Significant improvements in compliance were noted when system responsiveness or access were addressed (163-165). Patients scheduled for an appointment within 24 hours demonstrated significant improvements in attendance. One study (166) recorded an improvement of 31 percent when system responsiveness and access were improved. Mailed or telephonic reminders have been the other thrust of intervention programs. Decreases in no-show rates have ranged from 12 to 30 percent (167-174) when a reminder system was utilized.

In the case of the military health care delivery system, appointment making and keeping behavior could be facilitated with some system changes. The Surgeon General has mandated (175) decentralized appointment systems be established to allow appointments to be scheduled with greater ease. Mailed or telephonic reminders could be used to insure appointment attendance. However, the basic problem with these administrative changes is that they eliminate some system "gatekeeping" mechanisms. Increasing access without increasing resources can actually have a negative impact on the quality of care. As Shortell (176) stated,

The relationship between accessibility and continuity is also problematic. As implied earlier, increasing accessibility to services without changes in supply or organization places heavy demands on existing providers and organizations. A principle coping mechanism in such cases is to spend less time per patient and increase referral activity to other physicians and agencies, decreasing the probability of continuous, coordinated care.

The "solutions" the military health care delivery system selects to improve



the problems of access and continuity must be carefully chosen as proposed solutions such as the decentralized appointment system may be accompanied by unforeseen problems which actually reduce the quality of care.

The military health care system must "come to grips" with the fact that some controls must be built into the system. Unrestrained demand can not be realistically met in this, or any, system. Some sort of rationing mechanism must be in place to adequately and appropriately meet the needs of the military beneficiary population. The related issue of "compliance facilitation" must also be addressed. The administrator and practitioner must clearly define the limits of system responsibility in facilitating compliance. Full compliance can be acquired of almost any patient - but at what cost? In this period of increasingly constrained resources, realistic limits must be clearly defined, justified, and adhered to in order to provide appropriate quality care.

Responses to the final time on the survey, "Suggestions for Improvement" could essentially be grouped into two categories. The main system deficit consistently identified was the appointment system. Complaints included such problems as difficulty contacting the appointment personnel and the scarcity of appointments. As discussed above, this mechanism appears to function as a system "gatekeeper" and any system modifications must be well planned and provided with adequate resources. Surprisingly, the majority of the surveyed non-compliant patients expressed high satisfaction with the care received at the hospital. This finding coincides with the results of the 1984 DoD Beneficiary Survey (Appendix F) which demonstrated overall high satisfaction with the BAMC health care delivery system.

## PRACTITIONER EXPECTATIONS

One of the rather unexpected findings of the study is the levels and variability of practitioner expectations of order completion. When the survey was staffed with the Deputy Commander for Administration, the Deputy Commander for Clinical Services, and the Chief, Department of Nursing, it was anticipated that responses to the survey questions would indicate practitioners expected between 90 to 100 percent compliance with their orders. In actuality, these responses are lower, particularly for the TMC and Dermatology Clinic (Table 4). Even within each clinic there were some differences in expectations as seen by the large standard deviations and wide confidence intervals.

Variations in expectations between clinics are summarized in Table 5. Due to sample size limitations the results cannot be generalized; however, the differences between clinics indicate some interesting trends within BAMC. The greatest variability in expectations was in the area of return appointments. Expectations for compliance with radiographic orders also demonstrated some variation; however, the results were not as highly significant as with return appointments. General Surgery practitioners appeared to have the highest expectations for return appointments with a mean expectation of 98.8 percent and the confidence interval extending down to 92.8 percent compliance. Conversely, the TMC had the lowest expectations for return appointment compliance with a mean of 71.4 percent and confidence interval to 26.6 percent (Table 4). In general, the Dermatology Clinic practitioners expressed lower compliance expectations than the other clinics. Table 5 demonstrates that the Dermatology Clinic expectations were consistently and significantly different from one or more clinics in all

areas.

The rather unexpected variations between clinics and the general deviation from the anticipated survey results raises some interesting questions and is worth further examination. Are there basic differences in ordering behavior, values, judgement, and personalities among the specialties? Or are the nature of the work and the patient "types" so varied as to account for the study results? Mechanic (177) believes there are substantial differences among "recruits" to the various specialties. He identifies differences in social background, personality, and values. He states, "such differences probably reflect both social selection and the influence of certain types of work on doctors' values, self images, and presentations of self" (178). Schwartz and Kart (179) believe medical judgement, values, and expectations are components of medical practice which are cultivated in medical training. Mechanic also considers the "socialization" process as key to practitioners expectations.

Over a period of four years, the student acquires not only massive amounts of information and a great variety of skills but also many attitudes and values that are shaped by the demands of medical work, a sense of confidence in his ability to take care of practical problems, and a repertoire of behavior shaped by clinical experience and responsibility (180).

Mumford (181) discusses the importance of the "profession" in determining the values, attitudes, and expectations of practitioners. She identifies the social control the profession exerts over its members and the tendency for the various professions to be taken as reference groups by their members.

Although there appears to be a strong argument for the theory that there are basic personality, value, and expectation differences among the

specialties, the very nature of medical practice must be considered as a contributing factor to the practitioners' expectations. Eisenberg identifies the influence of uncertainty in the practitioners' decisions, treatments, and expectations.

All doctors do not practice alike, but the fact that there is wide variation in medical practice should not be surprising. There are few iron clad rules for practicing medicine; too much of it is an exercise in dealing with uncertainty (182).

Schwartz and Kart (183) agree that the practice of medicine is complex and ambiguous, full of conflicting opinions, unique patient problems, and wide differences in practitioner abilities. In order to deal with this uncertainty, many if not most practitioners tend to "overprescribe" tests, examinations, and referrals. As Mumford (184) noted, practitioners justify this practice by pointing to the case in which a potentially deadly disease was discovered early and successfully treated. Mechanic in his discussion of practitioner decision making notes that, "if the physician stops his search too soon he may fail to detect a serious condition" (185). He adds, "most clinicians believe that it is safer to explore too much than too little" (186). Medical training is also a factor in the practitioner's approach to the patient's diagnosis and treatment. This training emphasizes the importance of investigating the rare but dangerous possibilities so that these conditions can be reversed before it is too late (187). Practitioners in residency training programs such as at BAMC face even more uncertainty as they have not yet gained the experience with which to temper their orders. Although most practitioners justify this "over-investigation" based on humanitarian concerns for the patient's well being (188), the legal implications of "under-investigating" can also serve as a major factor in the

practitioner's decisions. Eisenberg (189) notes that although malpractice fears alone can not be used to explain medical decision making, there have been increasing numbers of malpractice suits which focus on the practitioner's use of diagnostic services.

The third factor contributing to the variability in practitioner expectations is the patient. Williams and Torrens (190) attribute a good deal of the practitioner's choice of examinations and tests to the influence of the patient. Often patients request examinations which are not likely to yield positive results, but which the practitioner orders to appease the patient. Insurance coverage or "free" care as in the case of the military, is a major factor in this also as it removes the cost controls which may have restricted or prevented such patient requests. Eisenberg (191) agrees that patient demand is one of the major factors in drug prescribing, surgery, performing hysterectomies, referral, and diagnostic testing. He also reports that patient expectations had been a factor in 66 percent of the decisions to order upper gastrointestinal radiographic series in a recent study. Eisenberg (192) also notes that the practitioner's consideration for patient convenience and economic interest also influence the decision to order diagnostic tests, drugs, referrals, or follow up appointments.

It appears that several factors contribute to the practitioner's prescribing behavior and expectations. These include the "internal" factors of personality, values, and attitudes as well as the "external" factors of patient expectations and economic status and the general uncertainty in medicine. The expectation results may be explained by the practitioner's anticipation of the amount of useful information and treatment results expected. As discussed, examinations and referrals may be ordered, not in anticipation of a "true" result, but rather to insure "all bases are covered"

or to appease the patient. Therefore, it may not be so surprising that the practitioners' acceptable levels of compliance are less than 100 percent and are so varied among the specialties.

## DATA ACCURACY

The Ambulatory Care Data Base Study has been in place for nine months at BAMC. A major purpose of the study is to identify the various diagnostic groups and the resources required to treat these groups at BAMC. It is a pilot study which is anticipated to have DoD wide implications over the next few years.

Results from the current study (Table 2) raise some questions about the accuracy of the data being collected for the Ambulatory Care Data Base study. Although the current study did not address the accuracy of clinical areas such as diagnosis and treatment procedures, the inaccuracies found in the areas of supporting resources are cause for some concern. The absence of the medical records prevent any definite conclusion on the accuracy of the data base; however, since the medical records have no real impact on the data the practitioner enters, it may be reasonably assumed, for discussion purposes, that the "known" data is representative of overall data accuracy. Utilizing the "known" data as a basis, it is seen that almost half (42.6%) of the patients had some sort of data inaccuracy related to the practitioners' orders. A major source of the inaccuracies was the radiographic data. Data from the medical record and/or TRIRAD failed to support the Ambulatory Care Data Base study information on numerous radiographic study orders. Since there was such a large percentage of data not replicated on the TRIRAD data base, the basis for the Department of Radiology workload statistics, and the medical record, any patient which had a radiographic order indicated by the Ambulatory Care Data Base but did not have a record of any examination in the TRIRAD data base was assumed to have a data inaccuracy. Therefore, only partial system compliance and full compliance are indicated under

"Radiographic Order Compliance" (Table 2).

Results of the Chi-Square analysis (Table 3) indicate there are significant differences between clinics in terms of accuracy. The Dermatology Clinic data proved to be fairly accurate with only 5.8 percent of the data (or 11.6% of the "known" portion) inaccurate (Table 2). It must be recognized that the Dermatology Clinic also ordered the fewest number of radiographic requests and the possibility of a data base error or malfunction can not be eliminated. The Pediatric Clinic demonstrated the most inaccuracies in the data with 36.3 percent (or 50.7% of the "known" data) not replicated.

At present, these data inaccuracies may not appear too significant to the practitioner or perhaps even the administrator. This data is only being collected for a study, without any "real world" implications. The problem arises when this data is applied for resource allocation. The quality of this data is essential to provide an accurate and equitable basis for resource allocation. Data inaccuracies can have a significant impact on revenue and organization viability. Authors (193-194) have noted significant increases in revenue when data coding errors were corrected. A recent Veteran's Administration study demonstrated that 58 percent of the coding corrections resulted in a higher Diagnostic Related Group (DRG) category (195). As Currie (196) noted, "individual hospitals' survival and growth in a prospective payment environment depend on management's abilities to develop both an aggressive strategic plan and short-term monitoring systems to ensure the quality of the clinical data." Other authors (197-199) have questioned the validity of reported data and the economic impact of the data problems. Although these coding errors refer to problems in reimbursement data, equal, if not greater impact can be seen with actual data base inaccuracies.



A portion of the inaccuracy appears to be attributable to some sort of system problem with the radiographic data. However, the rest of the inaccuracies can only be attributed to the practitioners completing the data forms. Other studies (200) have also attributed a large portion of error (up to 70%) to the practitioner. Possibly the reluctant cooperation of physicians in what is seen as yet another tedious task contributes to the inaccuracies. The previously discussed practitioner values, attitudes, and expectations can explain a major portion of the inaccuracy tendencies and the significant differences between clinics in terms of accuracy.

Although it may be possible to explain the causes of the accuracy problem, it is of greater concern to remedy the problem. Practitioner education has been seen as the most direct method of improving data accuracy; however, this tactic alone has not been a successful method of obtaining practitioner cooperation (201). More success has been gained when such tactics as feedback and participatory management are utilized (202). Financial incentives and/or disincentives have been thought to be a tactic which would provide the greatest response; however, it is not clear how this could be translated into actual practice, especially in a military hospital (203).

## V. RECOMMENDATIONS/CONCLUSION

The primary question of the feasibility of a tracking mechanism to evaluate the quality of the administrative inputs has been answered. A tracking mechanism as a means of assessing specific administrative functions in the health care delivery process is not feasible at this time. The study found, as De Freise (204) discussed, not a failure of the basic theory, but a failure of measurement. The theory behind the study was sound, administrators must evaluate their inputs into the system. The tracking mechanism was also sound as it did not limit the evaluation to the clinical areas of diagnosis and treatment, but rather attempted to assess the administrative inputs based on the standards set by the "experts", the practitioners. The mechanism also was not limited to a single encounter but rather assessed system responsiveness over a period of time for an episode or portion of an episode of illness. Unfortunately, the theory failed to become reality as the present information system was found to be inadequate to accurately measure the inputs. It should not be interpreted, however, that this theory should be abandoned. As data management and processing capabilities improve over the next few years, a tracking mechanism such as this should be relatively simple to implement. Data bases will be established for other areas such as the laboratory and pharmacy which will allow more rapid responses to order completion inquiries. The key to a successful tracking mechanism will be the integration of the various data bases such as TRIPAS, TRIRAD, TRILAB, and TRIPHARM. This integration will eliminate most of the time consuming tracking which had to be conducted in this study. As these systems "mature" and personnel become accustomed to use of the systems, data accuracy should improve significantly and, for

verification purposes, the medical record may be bypassed.

As with many research endeavors, this study raised more questions than it answered. Areas warranting further study include the following.

- The impact of record room location - can record maintenance be improved by locating the records in the patient's primary care clinic?

- What is the extent of the association between compliance with practitioner orders and record availability?

- What can the apparent differences in compliance be attributed to - patient "type"; practitioner style; practitioner ordering practices; clinic management practices; or some combination of the above?

- What is the cause of the apparent data inaccuracies - a system failure, practitioner input problems, or some combination?

Finally, some recommendations for improvement can be made. As previously stated, the area of medical records and data availability was a major deficit for the study. The influence of non-available records hindered efforts to determine the responsiveness of the system. Although it appears that most orders were completed, there is a notable lack of evidence to support this conclusion. Automation of the medical record has been proposed by many as a solution to this problem (205-218). The benefits of automation have been clearly identified and demonstrated in a variety of settings. Automation has been shown to be a cost efficient and effective method of maintaining and processing medical data. Benefits such as improved accuracy, ease of data retrieval, and ease of report formulation (data abstraction) have been noted. Record maintenance can be facilitated in the automated system with improved record tracking mechanisms, including bar coding and elimination of manual filing of reports. Tri-service medical information personnel have investigated the possibility of a "paperless" record; however,

a "hard copy" record has been mandated (219). The concept of a "Composite Health Care System" has been approved and bids are presently being evaluated for the system contract. A prototype of the system is to be tested at Dwight David Eisenhower Army Medical Center in 1987. This type of system should eliminate some of the difficulties encountered. The administrator will still encounter problems with patients maintaining their own records; however this system should allow at least partial reconstruction of the medical record to demonstrate order completion and documentation.

For the administrator assigned the responsibility for medical record maintenance, the automation solution is too far off in the future to be of any assistance in remedying today's problems. Several suggestions are offered to assist the administrator today. First and foremost, command emphasis on following the proper procedures in dealing with medical records is essential to raise the level of awareness among all staff members. System improvements must be made. A properly used bar coding system will facilitate record tracking. Medical record sections must be appropriately staffed and emphasis placed on conscientious record handling. Much of the problem lies in careless attitudes or a feeling of "burnout" among staff members overwhelmed by the tremendous volume of patients, records, and requirements. System changes are essential to raise the confidence level of patients and practitioners in the system. A marketing/education program should be implemented as the system improvements are established. Target groups for the marketing/education effort include patients, practitioners, ancillary staff, and administrators. The marketing/education effort must focus on the regulatory guidelines such as AR 40-66 and the JCAH standards as well as the system changes which have been implemented. Through these changes and programs, the record maintenance should come closer to meeting the regulatory

requirements. It is impossible to remedy all of the medical record problems in a system such as this; however, system improvements will at least make the system manageable and functional.

Patient compliance was a central issue in the study as many of the administrative areas can influence patient satisfaction, and therefore, influence compliance. Although no definite conclusion could be reached on patient compliance due to the lack of information, the results do indicate that patient compliance is less than expected. In the ambulatory care setting the patient has a great deal of control over the encounter and treatment. Follow through on practitioner orders depends primarily on the patient. Patient satisfaction, confidence, and a good patient-practitioner relationship contribute much to patient compliance. The lack of satisfaction and confidence has been recognized as a significant problem for the Army Medical Department (AMEDD). The Surgeon General has stated, "some of our patients no longer believe that we can perform our mission or that we care about them" (220). He adds, "it must be understood that without our patients we cannot accomplish our mission" (221). He directs that AMEDD personnel initiate a marketing effort which recognizes system problems but focuses on efforts to improve care. Staff directly involved in patient contact are the ones who will determine the success of this program. Locally, a participatory management approach in which practitioners can identify problem areas and solutions is recommended in the marketing effort. This technique will increase the staff commitment to improvement efforts. Staff education and feedback should be a primary technique used to raise general awareness of the problem. System changes can be made which facilitate compliance and patient satisfaction such as clinic scheduling follow up appointments for the patient and/or appointment reminders. These changes can contribute much to

the "we care" campaign.

The primary dilemma in system changes, as previously discussed, is the question of limit setting. How much should be facilitated? At what point do we stop being "all things to all people?" The problem is that it is often too uncomfortable for the practitioner or administrator to put limits on the care provided. "Indirect" limits which are more comfortable are usually used in this system. Indirect limits refer to the gatekeeping mechanisms of limited access and appointment availability. It is much easier to respond, "there are no appointments available" to a patient than it is to state, "this will not be ordered for you just because you want it." As Williams and Torrens (222) note, this situation can easily lead to an adversarial relationship, directly countering marketing efforts. It is recommended that the AMEDD as a whole define its care parameters and to discontinue the use of the appointment system as a gatekeeping mechanism. Although this is easily stated, it is recognized that it will be difficult to accomplish. A multitude of political, social, and economic factors will impact on the decision to identify and delineate care parameters. Nonetheless, parameters must be addressed as the current system's gatekeeping mechanism, as seen in the study, is a constant source of frustration and dissatisfaction for patients. Unless constructive changes are made, even the "we care" marketing campaign will have little success in improving patient satisfaction, confidence, and ultimately, compliance.

As a final recommendation, the Ambulatory Care Data Base inaccuracies must be addressed. System problems are suspected based on the results of this study and should be investigated. Accuracy studies should continue to insure reliable data enter the system and provide a sound basis for future decision making. Gaining physician cooperation will be key in ensuring data

accuracy. Education programs and some feedback have been attempted with minimal to moderate success at BAMC. In addition to command emphasis, financial incentives/disincentives are possibly the key to cooperation. Data from the Ambulatory Care Data Base study could be used as a basis for MEDCASE allocations and/or some supply budgeting. Apparently another Army medical treatment facility has attempted this tactic. A comparative study of data accuracy between facilities with and without the financial incentive/disincentive program would provide valuable information and guidance on methods of gaining cooperation.

In summary, this project demonstrated that a tracking mechanism is not a feasible and effective tool for the administrator at this time due to limitations in the hospital information systems. Valuable knowledge was also gained in the areas of medical record system functioning; system and patient compliance; practitioner expectations; and Ambulatory Care Data Base accuracy. Perhaps the most important question raised dealt with the identification of limits in the AMEDD health care delivery system. Hopefully, this study will add a "teaspoon of impetus" to the push for system change.

## APPENDIX A

### REFERRAL CLINICS ON THE BAMC CENTRAL APPOINTMENT SYSTEM

Allergy Clinic	Adolescent Medicine Clinic
Amputee Clinic	Audiology Clinic (Hearing Tests)
Child Health Conference	CT / CAT Scans
Dermatology Clinic	Diet Therapy Clinic
ENT Clinic	Gastroenterology Clinic
General Surgery Clinic	Gynecology Clinic
Health Screening Clinic	Internal Medicine Clinic
Medical Exam Service	Nephrology Clinic
Nuclear Medicine Scans	Obstetrics / Post Partum
Occupational Therapy Clinic	Ophthalmology Clinic
Optometry Clinic	Orthopedic Clinic
Pain Control Clinic	Pediatric Clinic
Physical Medicine Clinic	Physical Therapy Clinic
Plastic Surgery Clinic	Podiatry Clinic
Pulmonary Disease Clinic	Rheumatology Clinic
Ultra-Sound	Well Baby Clinic



REFERRAL CLINICS  
NOT INCLUDED IN THE STUDY

Cardiology Clinic	Cardiothoracic Surgery Clinic
Child Guidance Service	Community Health Nurse
Community Mental Health	Dental Clinic
Diet Therapy (Diabetes)	Drug and Alcohol Control
Endocrine Clinic	Hematology/Oncology Clinic
Hypertension Clinic	Immunization Clinic
Infectious Disease Clinic	Neurology and EEG Clinic
Neurosurgical Clinic	Occupational Health Clinic
Oncology - Gynecology	Oral Surgery Clinic
Psychiatric Consultation	Psychiatry (Adolescent)
Pulmonary Function	Radiation Therapy
Respiratory Therapy	Social Health (VD)
Social Work Service	Special Procedures (Cardiology)
Speech Pathology	Thoracic Surgery Clinic
Tuberculosis Clinic	Urology Clinic

## APPENDIX B

### DATA FROM THE AMBULATORY PATIENT CARE DATA BASE FORM INCLUDED IN THE STUDY

#### I. PATIENT DATA

- A. Encounter Date
- B. Sponsor's Social Security Number
- C. Family Member Prefix

#### II. PROVIDER DATA

- A. Disposition:
  - Return Appointment
- B. Ordered Out of Clinic:
  - 1. Laboratory
  - 2. X-Rays (except MR Scan)
- C. Referrals and Supplemental Disposition:
  - Referred to other clinic

DATA FROM THE  
AMBULATORY PATIENT CARE DATA BASE FORM  
NOT INCLUDED IN THE STUDY

I. PROVIDER DATA

- A. Provider Identification
- B. Reason for #2 Care Provider
- C. Primary Reason for This Visit
- D. Disposition (except for Return Appointment)
- E. Ordered Out of Clinic:
  - 1. Prescriptions
  - 2. Other
- F. Referrals and Supplemental Disposition (except for  
Referred to Other Clinic)
- G. Evaluation / Services / Procedures
- H. Job Related Illness / Injury
- I. Unlisted Diagnosis

III. ADMINISTRATION DATA

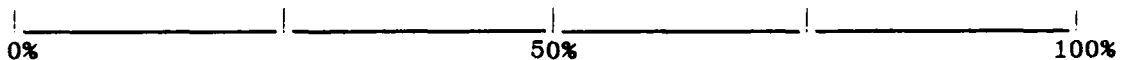
- A. UCA Data
- B. Place of Visit
- C. Appointment Status
- D. Status of Visit

## APPENDIX C

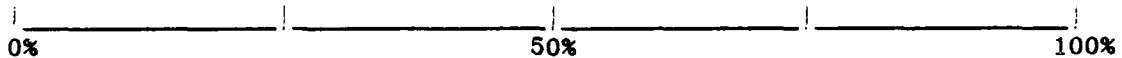
### COMPLIANCE/SUPPORT SURVEY

1. This survey will take less than one minute to complete.
2. Please indicate a point which you feel is acceptable in the accomplishment of your treatment orders for each area. This acceptable point should be based on your experience as a practitioner, your knowledge of system responsiveness, and patient behavior.
3. Each area should be completed by answering, "I can accept \_\_\_\_\_% compliance with my (radiographic, laboratory, referral, return appointment) orders."

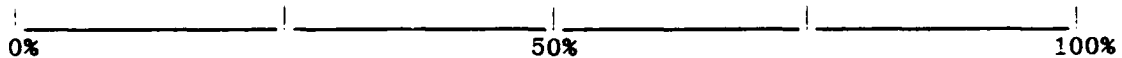
#### RADIOGRAPHIC ORDERS



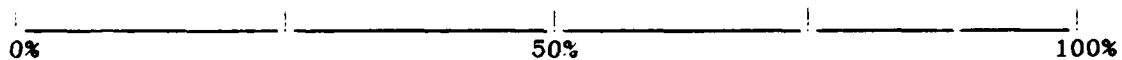
#### LABORATORY ORDERS



#### REFERRAL ORDERS



#### RETURN APPOINTMENT ORDERS



ADDITIONAL COMMENTS:

## APPENDIX D

### PATIENT COMPLIANCE SURVEY

#### I. INTRODUCTION

Good \_\_\_\_\_, I am CPT Lopez. I am conducting a study at Brooke Army Medical Center. I want to determine what the hospital can do to improve services. To accomplish this, I want to ask you some questions. All information provided will be confidential. The survey findings will not refer to anyone by name, telephone number, or any other identifying information. Will you help us by answering a few questions? The survey will take about two minutes.

#### II. PATIENT BACKGROUND INFORMATION

- A. What is (patient's name) age? \_\_\_\_\_
- B. What is (patient's name) beneficiary status?
1. Active Duty \_\_\_\_\_
  2. Family member of Active Duty \_\_\_\_\_
  3. Retired \_\_\_\_\_
  4. Family member of Retired Member \_\_\_\_\_
- C. What is your (or sponsor's) present rank?
1. Officer \_\_\_\_\_
  2. Enlisted \_\_\_\_\_

#### III. PATIENT INFORMATION

- A. How far does (patient's name) live from BAMC?  
\_\_\_\_\_
1. Under 5 miles
  2. 5 to 10 miles
  3. 10 to 15 miles
  4. 15 to 20 miles
  5. Over 20 miles

D. What is (patient's name) primary means of transportation? \_\_\_\_\_

1. Private Auto
2. Public transportation
3. Taxi
4. Friend / relative
5. Other \_\_\_\_\_

### III. COMPLIANCE

A. Our records show that (patient's name) has recently:

- Missed an appointment at \_\_\_\_\_ Clinic on (date).
- Not received an requested test, x-ray, examination, or procedure.
- Not made an appointment with \_\_\_\_\_ Clinic as the Doctor requested on (date).

B. Are our records correct?

1. Yes \_\_\_\_\_
2. No \_\_\_\_\_

C. Do you recall the reason (patient's name) was unable to:

- Make the appointment?
- Complete the test, x-ray, examination, procedure?
- Schedule the appointment?

(Refer to list of reasons and code in appropriate category:)

1. Personal Reason/Health Attitudes \_\_\_\_\_
2. Prov\_der/Treatment Specific reason \_\_\_\_\_
3. Appointment system problems \_\_\_\_\_

[EXAMINER: Who was the source of the noncompliance? \_\_\_\_\_]

1. Patient

2. Responsible family member

D. Do you have any suggestions for improvements in the  
delivery of health care at BAMC? \_\_\_\_\_

Thank you for your time and cooperation. Your answers will  
be compiled with responses from other patients and will be  
used to try to improve the care provided at BAMC.

-----  
POTENTIAL REASONS FOR NON-COMPLIANCE

I. PERSONAL REASONS / HEALTH ATTITUDES.

- A. The weather was too bad.
- B. Transportation problems.
- C. I was working and could not get time off.
- D. I had to return to work.
- E. I did not have time to go to all of the places the  
doctor told me to go.
- F. Child care problems.
- G. I was feeling too sick the day of the appointment.
- H. Financial problems.
- I. I was out of town.
- J. There was a family medical problem priority.
- K. I felt OK and did not need to see the doctor or  
complete the tests or procedures.
- L. I was just seen by another doctor a few days before.

II. PROVIDER / TREATMENT SPECIFIC

- A. Lack of confidence in the provider - did not agree  
with the ordered treatment or tests.
- B. I was afraid / do not enjoy the treatment, test, or  
exam ordered.
- C. I did not like the way I was treated.
- D. I saw another doctor.
- E. I did not understand the doctor's orders.
- F. I did not want to wait so long in the clinic(s).

IV. APPOINTMENT SYSTEM

- A. I forgot about the appointment.
- B. I did not know of the appointment.

- C. I could not get through to make the appointment.
- D. The appointment system was "down" when I tried to call.
- E. It takes too long to make an appointment.
- F. There was not an appointment time available - all of the appointments were booked.
- G. I thought I had cancelled the appointment.
- H. There was a conflict with another appointment.
- I. I lost the appointment time and did not know who to call.
- J. I went, but it was the wrong day.



**APPENDIX E**  
**SUMMARY OF**  
**STUDY RESULTS AND**  
**STATISTICAL ANALYSES**

**Table 2**  
**Relative Frequencies - All Variables**

VARIABLE	TOTAL	CL 1	CL 2	CL 3	CL 4	VARIABLE	TOTAL	CL 1	CL 2	CL 3	CL 4
1. Age						13. Referral Status					
a. 0-17	29.8	1.0b	2.0b	15.4	100.0	a. Unsched'd	16.0a	16.7b	12.5b	100.0b	9.1b
b. 18-39	30.0	94.0	14.0	13.4	0.0	b. Scheduled	41.0	33.3a	50.0b	0.0	54.5a
c. 40+	40.1	5.0b	84.0	71.2	0.0	c. Not Treated	13.5a	8.3b	25.0b	0.0	19.2b
2. Status						d. Unknown	29.5	41.7a	12.5b	0.0	19.2b
a. AD	27.1	99.0	3.0b	7.7a	0.0	15. Return Status					
b. D/AD	32.5	0.0	18.0	21.2	90.2	a. Unsched'd	21.5	25.8a	35.2	18.6	3.4b
c. RET	16.0	1.0b	28.0	34.6	0.0	b. Scheduled	28.0	0.0	17.1	40.2	39.0
d. D/RET	24.4	0.0	57.0	36.5	9.8a	c. Not Treated	32.7	3.2b	47.7	40.2	13.6a
3. Rank						d. Unknown	17.8	71.0	0.0	1.0b	44.0
a. Officer	34.2	13.0	38.0	56.7	28.4	16. Attendance					
b. Enlisted	65.5	87.0	52.0	43.3	71.0	a. Missed Appt	0.7b	0.0	0.0	2.1b	0.0
4. Init'l Visit Status						b. Cancelled	1.3b	0.0	2.3b	1.0	1.4b
a. Scheduled	60.1	0.0	89.0	18.3	31.4	c. Attended	50.2	37.7	55.1	55.7	41.9
b. Unsched'd	39.9	100.0	11.0	80.8	68.6	d. No Appt Sched	28.3	5.7b	41.6	40.2	10.8a
5. Lab Orders						e. Unknown	19.5	56.6	1.0b	1.0b	45.9
a. None	90.5	71.0	97.0	90.4	73.5	17. Retrn Documentation					
b. 1+ Ordered	19.5	29.0	13.0	9.6	26.5	a. Not Present	52.7	37.5b	73.3	54.7	16.0b
6. X-Ray Orders						b. Present	47.3	62.5b	26.7	45.3	84.0
a. None	81.8	70.0	68.0	97.1	91.2	18. Refrl Documentation					
b. 1+ Ordered	18.2	30.0	32.0	2.9b	8.8a	a. Not Present	30.8a	50.0a	0.0	0.0	25.0b
7. Referral Order						b. Present	69.2	50.0a	100.0b	100.0b	75.0a
a. Not Ordered	90.4	77.0	95.0	99.0	90.2	19. X-Ray Documentation					
b. Ordered	9.6	23.0	5.0b	1.0b	9.8a	a. Not Present	89.3	88.0	90.9	100.0b	85.7a
8. Return Order						b. Present	10.7a	12.0b	9.1b	0.0	14.3b
a. Not Ordered	32.0	68.0	12.0	6.7a	42.2	20. Lab Documentation					
b. Ordered	68.0	32.0	88.0	93.3	57.8	a. Not Present	57.8	73.0	91.7	25.0b	36.0a
9. Record Availability						b. Present	42.2	27.0a	8.3b	75.0a	64.0
a. Not Avail	26.7	69.0	30.0	26.0	22.5	21. Return Compliance					
b. Available	46.6	25.0	47.0	53.8	59.8	a. No Compliance	23.9	3.1b	34.3	30.5	12.1a
c. Temp Rec'd	16.7	6.0a	23.0	20.2	17.6	b. Unknown	20.1	55.6	1.4b	1.2b	44.9
10. Documentation						c. Part Pt Compl	2.5a	9.4b	2.7b	3.7b	1.7b
a. Not Present	55.7	74.0	55.0	51.0	43.1	d. Part Sys Compl	28.0	15.6b	45.2	35.4	5.2b
b. Present	44.3	26.0	45.0	49.0	56.9	e. Full Compliance	25.5	6.3b	16.4	29.2	36.2
11. Accuracy						22. Referral Compliance					
a. Not Replctd	22.9	27.0	23.0	5.9a	36.3	a. No Compliance	7.9b	8.7b	0.0	0.0	10.0b
b. Replicated	30.8	16.0	27.0	44.2	35.3	b. Unknown	34.2	43.5a	25.0b	0.0	20.0b
c. Unknown	46.3	57.0	50.0	50.0	28.4	c. Part Sys Compl	18.4a	26.1a	0.0	0.0	10.0b
12. Appt in Time						d. Full Compliance	39.5	21.7b	75.0b	100.0b	60.0a
a. No	4.7	3.5b	4.2b	4.2b	6.9b	23. X-ray Compliance					
b. Yes	23.0	10.3b	14.1a	23.2	39.7	a. Part Sys Compl	90.7	91.7	90.5	100.0b	95.7a
c. Unknown	72.3	86.2	81.7	72.6	53.4	b. Full Compliance	9.3b	8.3b	9.5b	0.0	14.3b
						24. Lab Compliance					
						a. No Compliance	58.6	73.1	91.7	28.6b	76.0a
						b. Full Compliance	41.4	26.9a	9.3b	71.4b	64.0

Note: CL 1 = Troop Medical Clinic; CL 2 = General Surgery Clinic; CL 3 = Dermatology Clinic; CL 4 = Pediatric Clinic; Appt in Time = Ordered appointment within scheduled within time specified; Unknown = Could not be determined in absence of medical records; Part Pt Compl = Partial Patient Compliance (Ordered appointment scheduled but cancelled or missed); Part Sys Compl = Partial System Compliance (Order completed but documentation could not be found).

a Sample Size < 10

b Sample Size < 5

Table 3

## Results of Chi-Square Tests of Independence

	All Clinics		Clinics w/o TMC		Age	
	df	Chi-Square	Lambda	df	Chi-Square	Lambda
ACCURACY	6	46.478***	0.037	4	34.002***	0.046
RECORD AVAIL	6	63.520***	0.203	4	3.335	0.000
DOCUMENTED	3	21.059***	0.078	2	2.947	0.079
APPT IN TIME	6	16.765*	0.000	4	12.973*	0.000
REFRL STATUS	9	10.553	0.115	6	6.227	0.100
RETRN STATUS	9	163.122***	0.211	6	115.310***	0.116
RET COMPLNCE	12	126.589***	0.234	8	90.980***	0.155
REF COMPLNCE	9	9.225	0.217	6	1.525	0.000
RAD COMPLNCE	3	0.441	0.000	2	0.370	0.000
LAB COMPLNCE	3	15.516**	0.345	2	11.579**	0.455
	Recipient Status		Sponsor Rank		Record Availability	
	df	Chi-Square	Lambda	df	Chi-Square	Lambda
ACCURACY	6	15.987*	0.000	2	4.849	0.000
RECORD AVAIL	6	71.679***	0.203	2	10.790**	0.005
DOCUMENTED	3	17.825***	0.061	1	4.636*	0.028
APPT IN TIME	6	8.479	0.000	2	1.202	0.000
REFRL STATUS	9	8.928	0.077	3	11.829**	0.077
RETRN STATUS	9	76.589***	0.141	3	14.337**	0.011
RET COMPLNCE	12	57.080***	0.120	4	14.911**	0.046
REF COMPLNCE	9	10.006	0.217	3	4.428	0.000
RAD COMPLNCE	3	0.276	0.000	1	0.016	0.000
LAB COMPLNCE	3	6.853	0.172	1	0.944	0.000

Note: ACCURACY = Ambulatory Patient Care Data Base Accuracy; RECD AVAIL = Record Availability;  
DOCUMENTED = Initial Encounter Documented; APPT IN TIME = Appointment Within Specified Time; REFRL STATUS  
= Status of Referral Order; RETRN STATUS = Status of Return Appointment Order; RET COMPLNCE = Compliance  
with Return Appointment Order; REF COMPLNCE = Compliance with Referral Order; RAD COMPLNCE = Compliance  
with Radiographic Examination Order; LAB COMPLNCE = Compliance with Laboratory Test Order.

\*  $p < .05$ \*\*  $p < .01$ \*\*\*  $p < .001$

**Table 4**  
**Compliance Expectations and Results**

	All Clinics					
	Expected			Actual		
	Mean	Std Dev	95% Conf Int	CMPLT COMP	PART COMP	
RTN COMPLNCE	86.9	18.4	50.1	25.5	53.5	
REF COMPLNCE	91.9	14.2	63.5	39.5	57.9	
RAD COMPLNCE	94.7	10.4	73.9	9.3	100.0	
LAB COMPLNCE	94.4	11.2	72.0	41.4	?	

	Troop Medical Clinic					
	Expected			Actual		
	Mean	Std Dev	95% Conf Int	CMPLT COMP	PART COMP	
RTN COMPLNCE	71.4	22.4	26.6	6.3	21.9	
REF COMPLNCE	95.7	7.3	81.1	21.7	47.8	
RAD COMPLNCE	100.0	0.0	100.0	8.3	100.0	
LAB COMPLNCE	100.0	0.0	100.0	26.9	?	

	Dermatology Clinic					
	Expected			Actual		
	Mean	Std Dev	95% Conf Int	CMPLT COMP	PART COMP	
RTN COMPLNCE	76.7	20.0	36.7	29.2	64.6	
REF COMPLNCE	83.8	20.7	42.4	100.0	100.0	
RAD COMPLNCE	87.5	17.1	53.3	100.0	100.0	
LAB COMPLNCE	87.5	17.1	53.3	71.4	?	

	General Surgery Clinic					
	Expected			Actual		
	Mean	Std Dev	95% Conf Int	CMPLT COMP	PART COMP	
RTN COMPLNCE	98.8	3.0	92.9	16.4	61.6	
REF COMPLNCE	96.5	7.2	82.1	75.0	75.0	
RAD COMPLNCE	97.3	4.4	88.5	9.5	100.0	
LAB COMPLNCE	95.4	9.0	77.4	8.3	?	

	Pediatric Clinic					
	Expected			Actual		
	Mean	Std Dev	95% Conf Int	CMPLT COMP	PART COMP	
RTN COMPLNCE	93.3	12.7	67.9	36.2	41.4	
REF COMPLNCE	92.9	13.1	66.7	60.0	70.0	
RAD COMPLNCE	96.1	5.2	85.7	14.3	100.0	
LAB COMPLNCE	96.9	4.9	87.1	64.0	?	

=====

Note: 95% Confidence Interval determined based on calculated means and standard deviations; CMPLT COMP = Complete Compliance (Order completed & documented); PART COMP = CMPLT COMP + Partial Compliance (Order completed, no documentation found); RTN COMPLNCE = Compliance with return appointment order; REF COMPLNCE = Compliance with referral order; RAD COMPLNCE = Compliance with Radiographic examination order; LAB COMPLNCE = Compliance with laboratory examination order; ? = Unable to determine in absence of record.

Table 5  
ANOVA Results  
Practitioner Expectations

All Clinics

	df	F-Value
RTN COMPLNCE	3	7.55***
REF COMPLNCE	3	2.11
RAD COMPLNCE	3	3.31*
LAB COMPLNCE	3	2.63

Differences in Expectations Between Individual Clinics

Return Compliance

	df	T-Value
TMC : GEN SURG	40	3.8***
TMC : PEDS	40	3.0**
GEN SURG : DERM	40	-3.6***
DERM : PEDS	40	2.7*

Radiographic Study Compliance

	df	T-Value
TMC : DERM	40	2.7**
GEN SURG : DERM	40	-2.5*
DERM : PEDS	40	2.2*

Referral Compliance

	df	T-Value
GEN SURG : DERM	40	-2.3*

Laboratory Test Compliance

	df	T-Value
TMC : DERM	40	-2.5*
DERM : PEDS	40	2.2*

Note: Only significant differences between clinics are reported.

RTN COMPLNCE = Compliance with return appointment orders; REF COMPLNCE = Compliance with referral orders; RAD COMPLNCE = Compliance with radiographic examination orders; LAB COMPLNCE = Compliance with laboratory examination orders; TMC = Troop Medical Clinic; GEN SURG = General Surgery Clinic; DERM = Dermatology Clinic; PEDS = Pediatric Clinic.

\*  $p < .05$

\*\*  $p < .01$

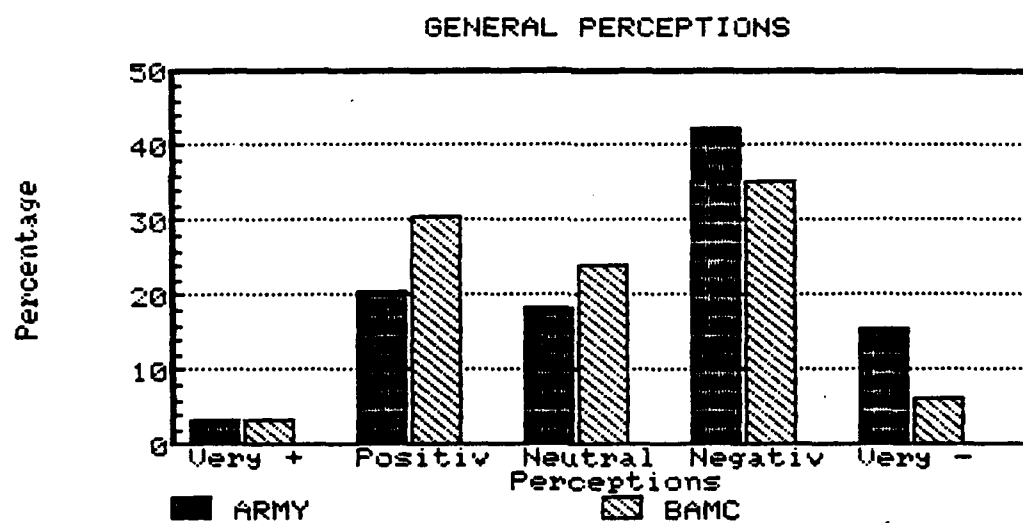
\*\*\*  $p < .001$

TABLE 6  
RESULTS OF NON-COMPLIANCE SURVEY

Variable	Group	Number	Percentage
AGE	0-17	4	36.4
	18-39	4	36.4
	Over 40	3	27.2
STATUS	Active Duty	2	18.2
	DEP of AD	5	45.5
	DEP of RET	4	36.3
RANK	Officer	4	36.4
	Enlisted	7	63.6
DISTANCE FROM BAMC	Under 5 Miles	5	45.5
	5 to 10 Miles	3	27.2
	10 to 15 Miles	1	9.1
	15 to 20 Miles	2	18.2
SOURCE OF TRANSPORTATION	Private Auto	10	90.9
	Public Trans/ Friend	1	9.1
CLINIC	TROOP MEDICAL	1	9.1
	GENERAL SURGERY	1	9.1
	DERMATOLOGY	6	54.6
	PEDIATRICS	3	27.2
TYPE OF NON-COMPLIANCE	Missed App't	1	9.1
	Failed to Return	10	90.9
SOURCE OF NON-COMPLIANCE	Patient	8	72.7
	Family Member	3	27.3
REASONS FOR NON-COMPLIANCE	Family Medical Priority	1	7.7
	Misunderstood Instructions	3	23.1
	Saw Another Physician	3	23.1
	Work Conflict	2	15.3
	Did Not Remember	3	23.1
	Did Not Desire Treatment	1	7.7
	Improve Appointment System	4	36.4
	Improve TMC Sick Call System	1	9.1
SUGGESTIONS FOR IMPROVEMENT	Satisfied with Care at BAMC	6	54.5

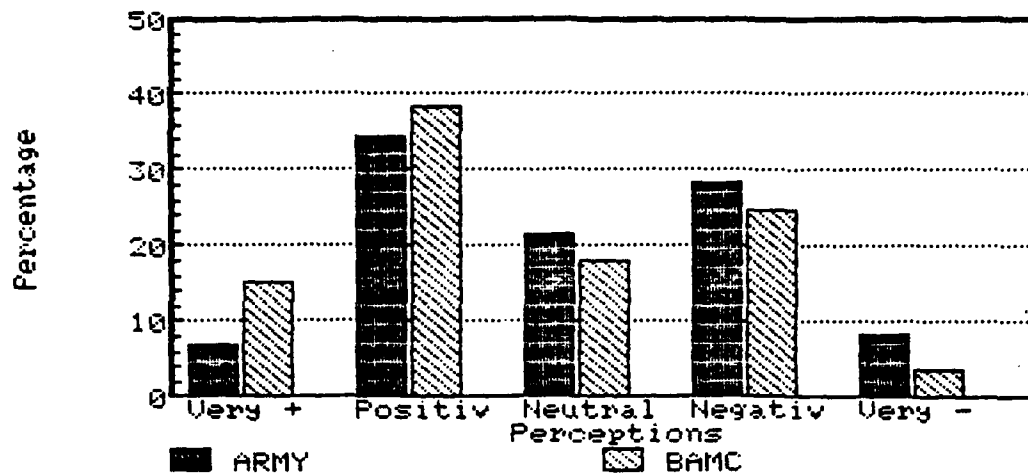
Note: Five patients identified as meeting the criteria for non-compliance could not be contacted for survey administration.

**APPENDIX F**  
**RESULTS OF THE**  
**DoD HEALTH CARE BENEFICIARY SURVEY**  
**1984**

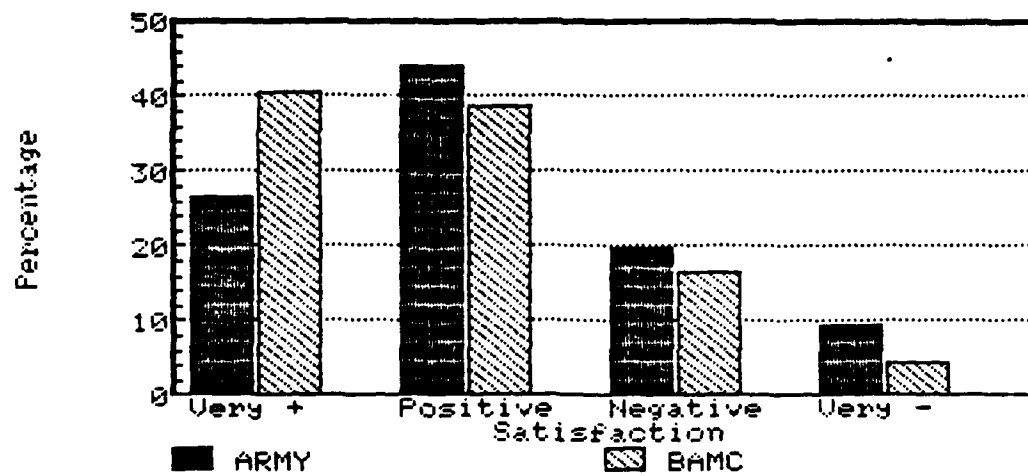




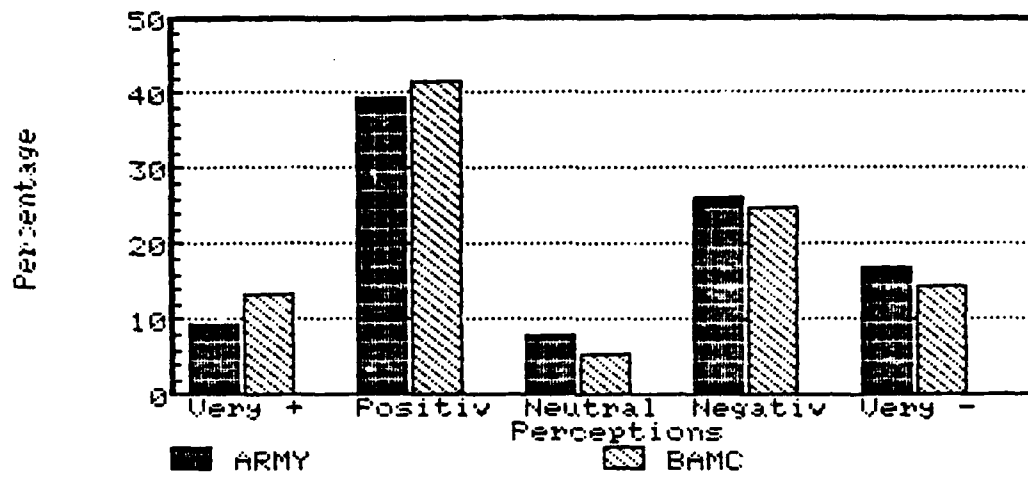
### PERCEPTIONS OF QUALITY



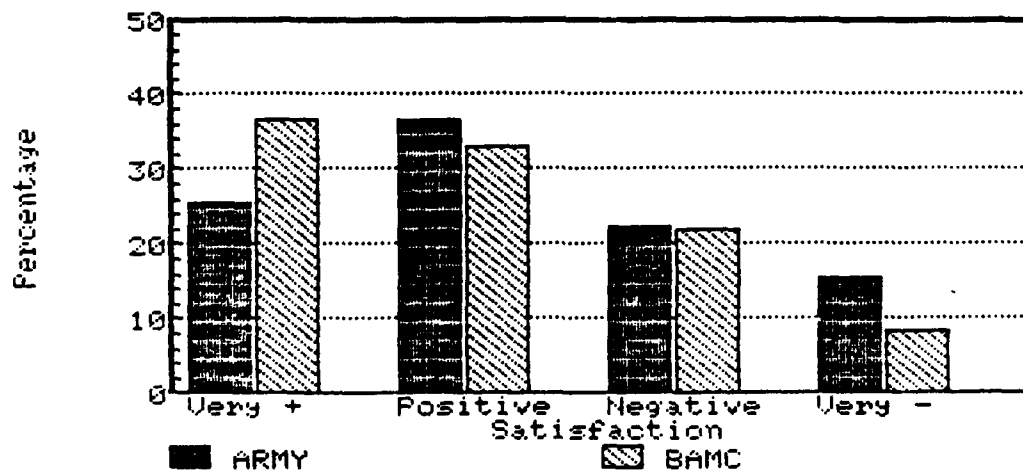
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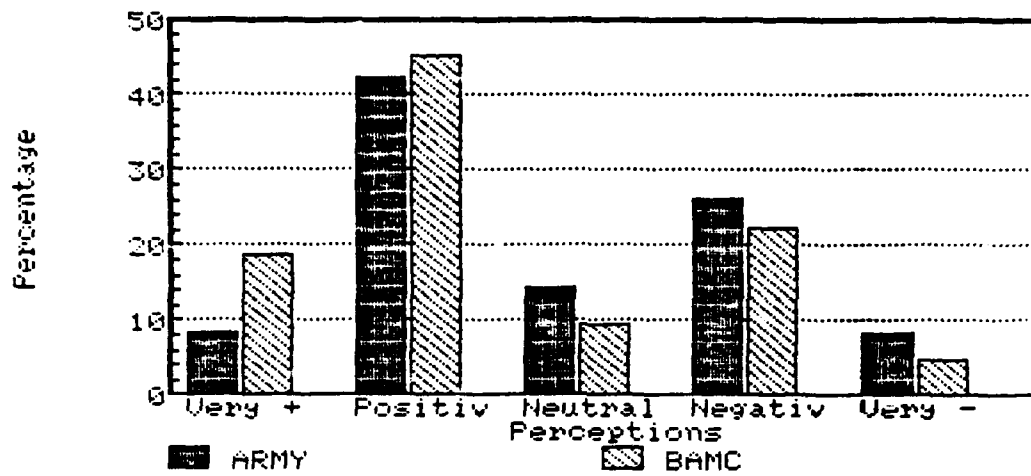
### PERCEPTIONS OF ACCESSIBILITY



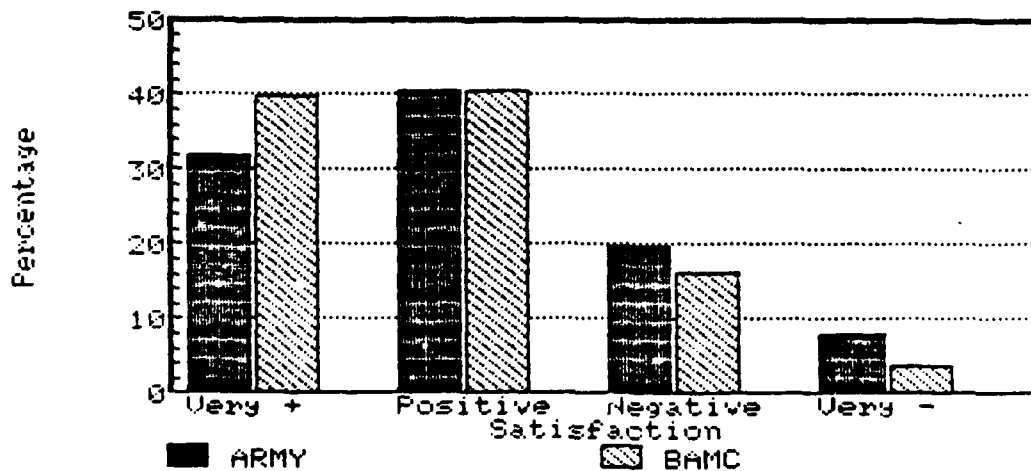
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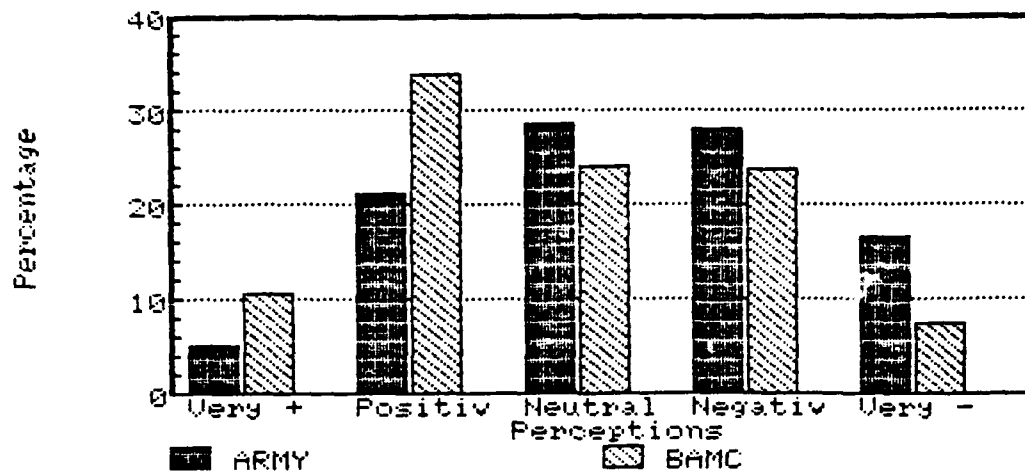
### PERCEPTIONS OF HUMANENESS



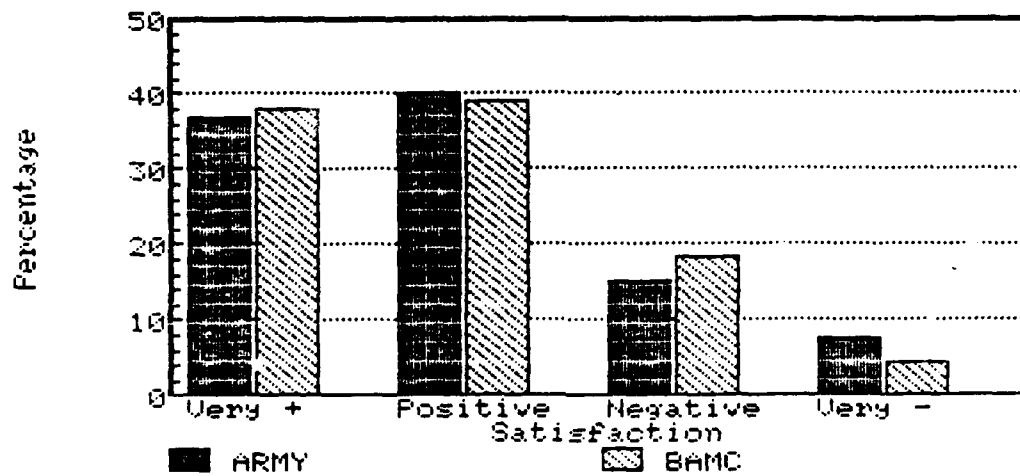
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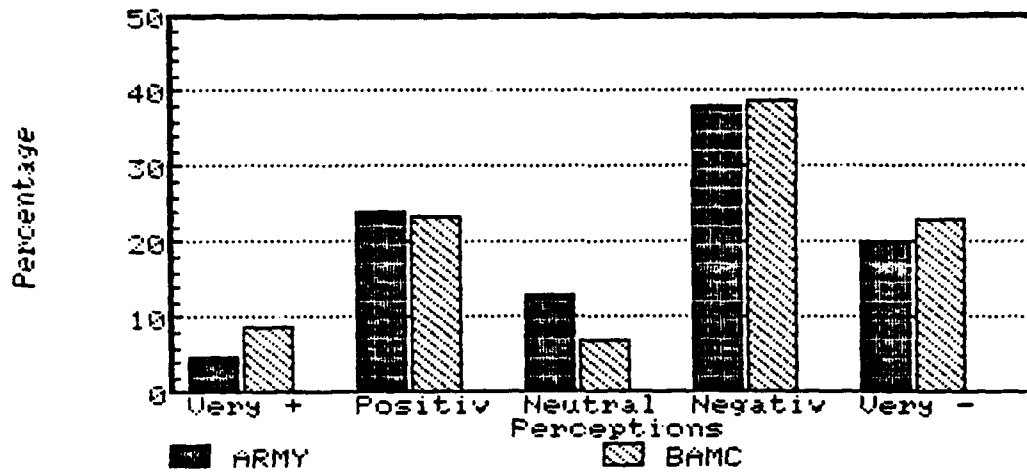
### PERCEPTIONS OF RESOURCES



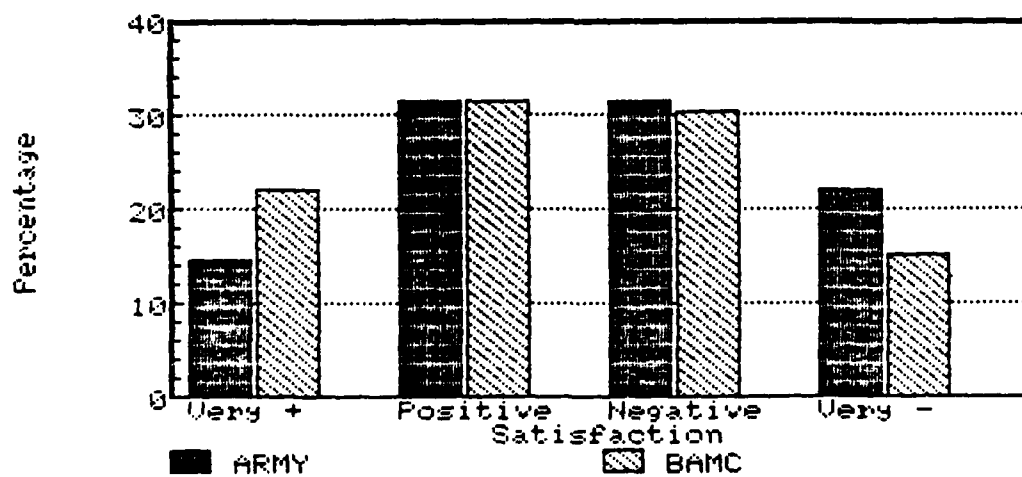
### BENEFICIARY SATISFACTION W/ RESOURCES



### PERCEPTIONS OF CONTINUITY



### BENEFICIARY SATISFACTION W/ CONTINUITY



## ENDNOTES

1. "Ex-Military Doctors Say Armed Services' Health Care is Inferior." San Antonio Express News, 17 January 1982, p. 1.
2. Donald Robinson, "The Mess in Military Medicine." Reader's Digest, February 1985, pp. 49-53.
3. Neil Roland, "Health Support Staff Can't Keep Pace." Army Times, 6 December 1982, p. 3.
4. Neil Roland, "Army Medicine: On the Mend." Army Times, 8 November 1982, p. 1.
5. Department of the Army, Office of the Inspector General, Information Letter / Audit Trends, (Washington, D.C. : Department of the Army) II: 4.
6. Quinn Becker, "AMEDD Goals and Objectives." Memorandum from the Office of the Surgeon General (DASG-ZXA) 30 April 1985.
7. Joint Commission on Hospital Accreditation, Accreditation Manual for Hospitals, (Chicago: JCAH, 1986) p. 205.
8. Stephen Williams and Paul Torrens. Introduction to Health Services. (New York: John Wiley and Sons, 1984) p. 136.
9. Emil Pascarelli. Hospital Based Ambulatory Care. (Norwalk, CT: Appleton-Century-Crofts, 1982) p. 3.
10. Donald I. Snook. Hospitals: What They Are and How They Work. (Rockville, MD: Aspen Systems Corporation, 1981) p. 41-2.
11. Pascarelli, Hospital Based Ambulatory Care, p. 6.
12. Williams and Torrens, Introduction to Health Services, p. 136.
13. Milton Roemer. An Introduction to the U.S. Health Care System. (New York: Springer Publishing Company, 1982) p. 73-6.
14. Ibid., p. 81-2.
15. Ibid., p. 83.
16. Avedis Donabedian. The Definition of Quality and Approaches to Its Assessment. (Ann Arbor: Health Administration Press, 1980) p. 3.
17. Ibid., p. 3.
18. Ibid., p. 4.

19. Herbert Schulberg; Alan Sheldon; and Frank Baker. Program Evaluation in the Health Fields. (New York: Behavioral Publications, 1969) p. 187.
20. Donabedian, The Definition of Quality, p. 5.
21. Ibid., p. 6.
22. Ibid., p. 14-15, 20-21.
23. Andy Anderson. Access to Medical Care. (Ann Arbor, MI: Health Administration Press, 1975) p. 2.
24. Ibid., p. 7.
25. Ibid., p. 3.
26. Stephen Shortell. "Continuity of Medical Care: Conceptualization." Medical Care 14:5 (May 1976) p. 377.
27. Donabedian, The Definition of Quality, p. 23.
28. Ibid., p. 23.
29. Marshall Becker. "Patient Adherence to Prescribed Therapies." Medical Care 23 (May 1985) p. 539.
30. Bonnie Tesch; Helena Lee; and Mary McDonald. "Reducing the Rate of Missed Appointments Among Patients New to a Primary Care Clinic." Journal of Ambulatory Care Management (August 1984) p. 32-33.
31. Becker, "Patient Adherence to Prescribed Therapies," p. 539.
32. Gordon A. Hagerman. "Testing the Mailed Appointment Reminder in Family Practice." Journal of Family Practice 7:1 (1978) p. 199.
33. Daniel Spadaro. "Factors Involved With Patient Compliance." Pediatric Nursing (July/August 1980) p. 28.
34. Donald Shepard and Thomas Moseley. "Mailed Versus Telephoned Appointment Reminders To Reduce Broken Appointments in a Hospital Outpatient Department." Medical Care 14:3 (March 1976) p. 268.
35. William Barron. "Failed Appointments." Primary Care 7:4 (December 1980) p. 563.
36. Paul Hofmann and John Rockart. "Implications of the No-Show Rate for Scheduling OPD Appointments." Hospital Progress (August 1969) p. 35.
37. Becker, "Patient Adherence to Prescribed Therapies." p. 539.
38. Ibid., p. 539.

39. Philip Hertz and Paula Stamps. "Appointment Keeping Behavior Re-Evaluated." American Journal of Public Health 67:11 (November 1977) p. 1035.
40. Arnold Hurtado; Merwyn Greenlick; and Theodore Colombo. "Determinants of Medical Care Utilization: Failure To Keep Appointments." Medical Care 11:3 (May-June 1973) p. 189, 192.
41. Spadaro, "Factors Involved With Patient Compliance," p. 28.
42. Barron, "Failed Appointments," p. 564-6.
43. Hurtado, "Determinants of Medical Care Utilization," p. 189.
44. Hertz, "Appointment Keeping Behavior," p. 1033.
45. Hurtado, "Determinants of Medical Care Utilization," p. 196.
46. Barron, "Failed Appointments," p. 566.
47. Becker, "Patient Adherence to Prescribed Therapies," p. 541.
48. Spadaro, "Factors Involved With Patient Compliance," p. 29.
49. Becker, "Patient Adherence to Prescribed Therapies," p. 547.
50. Ibid., p. 542.
51. Tesch, "Reducing the Rate of Missed Appointments," p. 37.
52. Barron, "Failed Appointments," p. 568.
53. Heather R. Palmer and Richard H. Nesson. "A Review of Methods for Ambulatory Medical Care Evaluations," Medical Care 20:8 (August 1982): 760.
54. Donabedian, The Definition of Quality, p. 81.
55. Ibid., p. 81-82.
56. Ibid., p. 103.
57. Ibid., p. 82-83.
58. Williams and Torrens, Introduction to Health Services, p. 419.
59. Donabedian, The Definition of Quality, p. 86-94.
60. Ibid., p. 89.
61. Becker, "Patient Adherence to Prescribed Therapies," p. 543.
62. Lola Wilmes. "Barriers to the Utilization of Health Care." The Oklahoma Nurse (May 1979) p. 3.
63. Palmer and Nesson, "A Review of Methods." p. 761.



64. Ibid., p. 761.
65. Ibid., p. 777-778.
66. Heather R. Palmer. "Does Quality Assurance Improve Patient Care?" Clinical Research 31:2 (April 1983) p. 480A.
67. Beverly Payne, et. al. "Method of Evaluating and Improving Ambulatory Medical Care." Health Services Research 19:2 (June 1984) p. 241.
68. Jesus Pena, et. al. Hospital Quality Assurance. (Rockville, MD: Aspen Systems Corporation, 1984) p. 4.
69. Snook, Hospitals: What They Are and How They Work, p. 194.
70. Ibid., p. 196.
71. Joint Commission on Accreditation of Hospitals. Accreditation Manual for Hospitals. (Chicago: JCAH, 1986) p. 205.
72. Joint Commission on Accreditation of Hospitals. Ambulatory Health Care Standards Manual. (Chicago: JCAH, 1986) p. 1.
73. Joint Commission. Accreditation Manual for Hospitals, p. 205.
74. Ibid., p. 207.
75. Department of the Army. Army Regulation 40-66: Medical Record and Quality Assurance Administration. (Washington, D.C.: HQDA, 31 January 1985) p. 33.
76. Brooke Army Medical Center. BAMC Memorandum 40-118: Medical Services Quality Assurance Program. (Fort Sam Houston, TX: Brooke Army Medical Center, 1 October 1985) pp. 4-5.
77. Williams and Torrens, Introduction to Health Services, p. 409.
78. Ibid., p. 409.
79. Howard Rowland and Beatrice Rowland. Hospital Administration Handbook. (Rockville, MD: Aspen Systems Corporation, 1984) p. 635-7.
80. Avedis Donabedian. The Criteria and Standards of Quality. (Ann Arbor: Health Administration Press, 1982) p. 154-169.
81. Heather R. Palmer. Ambulatory Health Care Evaluation: Principles and Practices. (Chicago: American Hospital Association, 1983) p. 57-60.
82. Rowland and Rowland, Hospital Administration Handbook, p. 637.
83. Ibid., p. 637.
84. Donabedian. The Criteria and Standards of Quality, p. 8.

85. Ibid., p. 8.
86. Ibid., p. 8.
87. Ibid., p. 19.
88. Palmer, Ambulatory Health Care Evaluation, p. 30.
89. Rowland and Rowland, Hospital Administration Handbook, p. 637.
90. Donabedian, The Criteria and Standards of Quality, p. 53-56.
91. Ibid., p. 57.
92. Palmer, Ambulatory Health Care Evaluation, p. 30-31.
93. Donabedian, The Criteria and Standards of Quality, p. 58.
94. Ibid., p. 58-59.
95. Ibid., p. 331-343.
96. Ibid., p. 154-169.
97. Rowland and Rowland, Hospital Administration Handbook, p. 638-640.
98. Ibid., p. 637.
99. Williams and Torrens, Introduction to Health Services, p. 409.
100. Brooke Army Medical Center, BAMC Memorandum 40-118, p. 16-17.
101. Palmer and Nesson, "A Review of Methods," p. 770.
102. Department of the Army, Army Regulation 40-66, p. 33.
103. Palmer and Nesson, "A Review of Methods," p. 760.
104. Ibid., p. 772.
105. Palmer, Ambulatory Health Care Evaluation, p. 39-47.
106. Maryland Hospital Education Institute. Hospital Sponsored Ambulatory Care. (Chicago: American Hospital Association, 1980) p. 94-95.
107. Williams and Torrens, Introduction to Health Services, p. 409.
108. Rowland and Rowland, Hospital Administration Handbook, p. 637.
109. Brooke Army Medical Center, BAMC Memorandum 40-118, p. 14-15.
110. Rowland and Rowland, Hospital Administration Handbook, p. 637.
111. Maryland Hospital, Hospital Sponsored Ambulatory Care, p. 97.

112. Williams and Torrens, Introduction to Health Services, p. 409.
113. Palmer and Nesson, "A Review of Methods," p. 774.
114. Palmer, Ambulatory Health Care Evaluation, p. 60.
115. Rowland and Rowland, Hospital Administration Handbook, p. 638.
116. Ibid., p. 638.
117. Palmer, Ambulatory Health Care Evaluation, p. 60.
118. Palmer and Nesson, "A Review of Methods," p. 774.
119. Rowland and Rowland, Hospital Administration Handbook, p. 637.
120. Maryland Hospital, Hospital Sponsored Ambulatory Care, p. 97-98.
121. Paul Wortman. Methods for Evaluating Health Services. (Beverly Hills, CA: Sage Publications, 1980) p. 107.
122. Ibid., p. 88-106.
123. Palmer and Nesson, "A Review of Methods," p. 774.
124. Rowland and Rowland, Hospital Administration Handbook, p. 638.
125. Maryland Hospital, Hospital Sponsored Ambulatory Care, p. 97.
126. Williams and Torrens, Introduction to Health Services, p. 409.
127. Pena, et. al., Hospital Quality Assurance, p. 11-12.
128. Palmer, Ambulatory Health Care Evaluation, p. 60.
129. Brooke Army Medical Center, BAMC Memorandum 40-118, p. 24.
130. Robert Gillette. "Medical Records - Friend or Foe?" Journal of the American Medical Record Association (March 1985) p. 24.
131. Pena, et. al., Hospital Quality Assurance, p. 207.
132. Bernard Brown. Risk Management for Hospitals: A Practical Approach. (Rockville, MD: Aspen Systems Corporation, 1979) p. 34.
133. Pena, et. al., Hospital Quality Assurance, p. 207.
134. Gillette, "Medical Records - Friend or Foe?" p. 24.
135. Palmer and Nesson, "A Review of Methods," p. 767.
136. Beverly Payne, et.al., "Method of Evaluating and Improving Ambulatory Medical Care." Health Services Research 19:2 (June 1984) p. 222.

137. Ibid., p. 222.
138. Mary S. Lopez. Memorandum for Record: Report of Findings from Review of Laboratory and Radiographic Report Filing Backlog in the Directorate of Patient Administration. (Fort Sam Houston, TX: Brooke Army Medical Center, 23 December 1985) pp. 2-5.
139. Department of the Army, Army Regulation 40-66, p. 3.
140. Ibid., p. 13.
141. JCAH, Ambulatory Health Care Standards Manual, p. 9.
142. Robert Toth as quoted by Hospital Risk Management. "Write Medical Charts with Jury in Mind, Experts Say." Hospital Risk Management 7:6 (June 1985) p. 69.
143. Robert Miller. Problems in Hospital Law. (Rockville, MD: Aspen Systems Corporation, 1983) p. 285.
144. Ibid., p. 273.
145. Becker, "Patient Adherence to Prescribed Therapies," p. 541.
146. Ibid., p. 540-541.
147. Chapin as quoted by Becker, "Patient Adherence to Prescribed Therapies," p. 541.
148. Becker, "Patient Adherence to Prescribed Therapies," p. 543.
149. Ibid., p. 551.
150. Hayes-Bautista, "Modifying the Treatemnt," p. 234.
151. Loy Reid; Charles Lewis; and William Wathen. "The Texas Individual Responsibility Philosophy." Texas Dental Journal (October 1977) p. 15.
152. William Meller and Arnold Anderson. "Medical Compliance." Minnesota Medicine (September 1976) p. 625.
153. Iris Litt and Walter Cuskey. "Satisfaction with Health Care." Journal of Adolescent Health Care 5:196 (July 1984)p. 196.
154. Spadaro, "Factors Involved With Patient Compliance," p. 29.
155. Barron, "Failed Appointments," p. 570.
156. Hofmann and Rockart, "Implications of the No-Show Rate," p. 35.
157. Becker, "Patient Adherence to Prescribed Therapies," p. 548-549.
158. Hurtado, et. al., "Determinants of Medical Care Utilization,"p. 196.

159. Ibid., p. 196.
160. Hertz and Stamps, "Appointment Keeping Behavior," p. 1033.
161. John Sharbaro. "Compliance: Inducements and Enforcements." Chest 76:6 (December 1979) p. 751.
162. Barron, "Failed Appointments," p. 567.
163. Ibid., p. 566.
164. Hertz and Stamps, "Appointment Keeping Behavior," p. 1034.
165. Tesch, et. al., "Reducing the Rate of Missed Appointments," p. 40.
166. Ibid., p. 40.
167. Barron, "Failed Appointments," p. 569.
168. Palmer and Nesson, "A Review of Methods," p. 769.
169. Rona Levy and Viqui Claravall. "Differential Effects of a Phone Reminder on Appointment Keeping for Patients with Long and Short Between Visit Intervals." Medical Care 15:5 (May 1977) p. 437.
170. Hertz and Stamps, "Appointment Keeping Behavior," p. 1033.
171. Meller and Anderson, "Medical Compliance," p. 625.
172. Lawrence Nazarian, et. al. "Effect of a Mailed Appointment Reminder on Appointment Keeping." Pediatrics 53:3 (March 1974) p. 349.
173. Donald Shepard and Thomas Moseley. "Mailed Versus Telephoned Appointment Reminders To Reduce Broken Appointments in a Hospital Outpatient Department." Medical Care 14:3 (March 1976) p. 268.
174. Tesch, et. al., "Reducing the Rate of Missed Appointments," p. 30.
175. Becker, "AMEDD Goals and Objectives," p. 1.
176. Shortell, "Continuity of Medical Care," p. 390.
177. Mechanic, Medical Sociology, p. 381.
178. Ibid., p. 381.
179. Howard Schwartz and Cary Kart. Dominant Issues in Medical Sociology. (Reading MA: Addison-Wesley Publishing Company, 1978) p. 204.
180. Mechanic, Medical Sociology, p. 380.
181. Emily Mumford. Medical Sociology. (New York: Random House, 1983) p. 251.

182. John Eisenberg. "Physician Utilization: The State of Research About Physicians Practice Patterns." Medical Care 23:5 (May 1985) p. 461.
183. Schwartz and Kart, Dominant Issues in Medical Sociology, p. 204.
184. Mumford, Medical Sociology, p. 262-263.
185. Mechanic, Medical Sociology, p. 423.
186. Ibid., p. 423.
187. Ibid., p. 423.
188. Eisenberg, "Physician Utilization," p. 461.
189. Ibid., p. 466.
190. Williams and Torrens, Introduction to Health Services, p. 419.
191. Eisenberg, "Physician Utilization," p. 466.
192. Ibid., p. 466.
193. M. Sue Currie. "Clinical Data Quality: Impact on Revenue." Journal of the American Medical Record Association (April 1985) p. 26-27.
194. Richard Corn. "The Sensitivity of Prospective Hospital Reimbursement to Errors in Patient Data." Inquiry 18 (Winter 1981)p. 358.
195. Susan Lloyd and J. Peter Rissing. "Physician and Coding Errors in Patient Records." Journal of the American Medical Association 254:10 (September 13, 1985) p. 1334.
196. Currie, "Clinical Data Quality," p. 27.
197. Michael Nathanson. "Computers Crank out DRG Cost Data, But How Valid is Information?" Modern Healthcare (September 1983) p. 160.
198. Michael Nathanson. "Experts: More Research Needed to Set Value of Code Programs." Modern Healthcare (June 1983) p. 98.
199. Corn, "The Sensitivity of Prospective Reimbursement," p. 351.
200. Lloyd and Rissing, "Physician and Coding Errors," p. 1334.
201. Steven Schroeder, et. al., "The Failure of Physician Education as a Cost Containment Strategy." Journal of the American Medical Association 252:2 (July 13, 1984) p. 225.
202. Nathanson, "Computers Crank out DRG Cost Data," p. 164.
203. Ibid., p. 164.

204. De Friese. "Monitoring and Evaluating Health Services," p. 738.
205. Payne, et. al., "Method of Evaluating," p. 223-227.
206. Palmer and Nesson, "A Review of Methods," p. 777-778.
207. Pena, et. al., Hospital Quality Assurance, p. 201-203.
208. Mark Thompson, et. al. "Resource Requirements for Evaluating Ambulatory Health Care." American Journal of Public Health 74:11 (November 1984) p. 1246.
209. Barry Ewell. "Computerization in the Medical Record Department at Pioneer Valley Hospital." Journal of the American Medical Record Association (February 1985) p. 42.
210. Mary Knutson. "Medical Records - Location and Control." Computers in Healthcare (November 1984) p. 26.
211. C. L. Packer. "Integration, Performance Key to Ambulatory Care Information Systems." Hospitals (May 16, 1985)p. 120-121.
212. Albert Eggert. "Benefits of Computerizing Medical Records Discussed." Texas Hospitals (October 1985) p. 22-23.
213. Anthony Komaroff. "Quality Assurance in 1984." Medical Care 23:5 (May 1985) p. 727.
214. Donald Steinwachs. "Ambulatory Care Management Information Systems: Future Directions." Journal of Ambulatory Care Management (May 1985) p. 84.
215. Myron Odell. "Clinical/Ancillary Systems." Topics in Health Care Financing (1978) p. 38-42.
216. John Sacco and Carl Longnecker. "Patient Management Systems." Topics in Health Care Financing (1978) p. 26-28.
217. Charles J. Austin. Information Systems for Hospital Administration. (Ann Arbor: Health Administration Press, 1983) p. 223.
218. Melville Hodge. Medical Information Systems. (Germantown, MD: Aspen Systems Corporation, 1977) p. 122.
219. Kenneth Wright. Interview on the Activities of TRIMIS Army. 16 April 1986.
220. Quinn Becker. "AMEDD Marketing Stratgy." Message from the Office of the Surgeon General (DASG-ZA), May 1986, p. 1.
221. Ibid., p. 1.
222. Williams and Torrens, Introduction to Health Services, p. 419.

## BIBLIOGRAPHY

- Aday, Lu Ann, and Andersen, Ronald. Access to Medical Care. Ann Arbor: Health Administration Press, 1975.
- Anderson, Andy. Access to Medical Care. Ann Arbor, MI: Health Administration Press, 1975.
- Anderson, Jack. "Medical Corps Called Ailing." San Antonio Express News. April 6, 1979.
- American Hospital Association. Hospital Statistics. Chicago: American Hospital Association, 1985.
- Austin, Charles J. Information Systems for Hospital Administration. Ann Arbor: Health Administration Press, 1983.
- Babbie, Earl R. Survey Research Methods. Belmont CA: Wadsworth Publishing Company, 1973.
- Barron, William M. "Failed Appointments." Primary Care 7 (December 1980): 563-574.
- Becker, Marshall H. "Patient Adherence to Prescribed Therapies." Medical Care 23 (May 1985): 539-554.
- Becker, Quinn. "AMEDD Goals and Objectives." Memorandum from the Office of the Surgeon General (DASG-ZXA), 30 April 1985.
- Becker, Quinn. "AMEDD Marketing Stratgy." Message from the Office of the Surgeon General (DASG-ZA), May 1986.
- Bennett, Addison C. "Quality of Care: Bridging the Gap Between Promise and Performance." Trustee (October 1984): 29-32.
- Berkanovic, Emil; Reeder, Leo; Marcus, Alfred; and Schwartz, Susan. Perceptions of Medical Care. Lexington, MA: Lexington Books, 1974.
- Best, John W. Research in Education. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1977.
- Brook, Robert and Lohr, Kathleen. "Efficacy, Effectiveness, Variations, and Quality." Medical Care 23 (May 1985): 710-721.
- Brooke Army Medical Center. BAMC Memorandum 40-118: Medical Services Quality Assurance Program. Fort Sam Houston, TX: Brooke Army Medical Center, 1 October 1985.
- Brown, Bernard. Risk Management for Hospitals: A Practical Approach. Rockville, MD: Aspen Systems Corporation, 1979.
- Corn, Richard. "The Sensitivity of Prospective Hospital Reimbursement to Errors in Patient Data." Inquiry 18 (Winter 1981): 351-360.



- Currie, M. Sue. "Clinical Data Quality: Impact on Revenue." Journal of the American Medical Record Association (April 1985): 25-27.
- Daniel, Wayne W. Biostatistics: A Foundation for Analysis in the Health Sciences. New York: John Wiley & Sons, 1983.
- De Friese, Gordon. "Monitoring and Evaluating Health Services." Medical Care 23:5 (May 1985): 735-738.
- Department of the Army. Army Regulation 40-66: Medical Record and Quality Assurance Administration. Washington, D.C.: HQDA, 31 January 1985.
- Department of the Army, Office of the Inspector General. Information Letter / Audit Trends. Washington, D.C.: Department of the Army, June 1985.
- Department of Defense. Why Beneficiaries Use the Military Health Care System: Findings From the Department of Defense 1984 Health Care Survey. Washington, D.C.: Assistant Secretary of Defense for Health Affairs, April 1985.
- Dillman, Don A. Mail and Telephone Surveys. New York: John Wiley and Sons, 1978.
- Donabedian, Avedis. The Definition of Quality and Approaches to Its Assessment. Ann Arbor: Health Administration Press, 1980.
- Donabedian, Avedis. The Criteria and Standards of Quality. Ann Arbor: Health Administration Press, 1982.
- Eggert, Albert. "Benefits of Computerizing Medical Records Discussed." Texas Hospitals (October 1985): 22-24.
- Eisenberg, John. "Physician Utilization: The State of Research About Physicians Practice Patterns." Medical Care 23:5 (May 1985): 461-482.
- Ewell, Barry. "Computerization in the Medical Record Department at Pioneer Valley Hospital." Journal of the American Medical Record Association. (February 1985): 42-43.
- "Ex-Military Doctors Say Armed Services' Health Care is Inferior." San Antonio Express News, 17 January 1982, p. 1.
- Fetter, Robert; Averill, Richard; Lichtenstein, Jeffrey; and Freeman, Jean; "Ambulatory Visit Groups: A Framework for Measuring Productivity in Ambulatory Care." Health Services Research 19:4 (October 1984): 415-437.
- Flanagan, Elizabeth. "Indicators of Quality in Ambulatory Care." Quality Review Bulletin (April 1985): 136-7.
- Gillette, Robert. "Medical Records - Friend or Foe?" Journal of the American Medical Record Association (March 1985): 24.

- Hagerman, Gordon A. "Testing the Mailed Appointment Reminder in Family Practice." Journal of Family Practice 7:1 (1978): 199-201.
- Hayes-Bautista, David E. "Modifying the Treatment: Patient Compliance, Patient Control, and Medical Care." Social Science and Medicine 10 (1976): 233-238.
- Hertz, Philip and Stamps, Paula. "Appointment Keeping Behavior Re-Evaluated." American Journal of Public Health 67:11 (November 1977): 1033-1036.
- Hofmann, Paul and Rockart, John. "Implications of the No-Show Rate for Scheduling OPD Appointments." Hospital Progress (August 1969): 35-40.
- Hodge, Melville. Medical Information Systems. Germantown, MD: Aspen Systems Corporation, 1977.
- Hospital Risk Management. "Write Medical Charts with Jury in Mind, Experts Say." Hospital Risk Management 7:6 (June 1985): 69.
- Hurtado, Arnold; Greenlick, Merwyn; and Colombo, Theodore. "Determinants of Medical Care Utilization: Failure To Keep Appointments." Medical Care 11:3 (May-June 1973): 189-198.
- Isaac, Stephen. Handbook in Research and Evaluation. San Diego: Edits Publishers, 1977.
- Joint Commission on Accreditation of Hospitals. Accreditation Manual for Hospitals. Chicago: JCAH, 1986.
- Joint Commission on Accreditation of Hospitals. Ambulatory Health Care Standards Manual. Chicago: JCAH, 1986.
- Joint Commission on Accreditation of Hospitals. Quality Assurance in Ambulatory Settings Workbook. Chicago: JCAH, 1982.
- Joint Commission on Accreditation of Hospitals. Quality Assurance in Support Services: Advanced Approaches. Chicago: JCAH, 1984.
- Joint Commission on Accreditation of Hospitals. Toward Quality Care - An Accreditation Standards Workshop for Ambulatory Health Care. Chicago: JCAH, 1984.
- Knapp, Robert E. "The Development of Outpatient DRG's." Journal of Ambulatory Care Management (May 1983): 1-11.
- Knutson, Mary L. "Medical Records - Location and Control." Computers in Healthcare (November 1984): 24-30.
- Komaroff, Anthony. "Quality Assurance in 1984." Medical Care 23:5 (May 1985): 723-733.

- Leventhal, Howard. "Commentary on The Role of Theory in the Study of Adherence to Treatment and Doctor-Patient Relationships." Medical Care 23:5 (May 1985): 556-563.
- Levy, Rona and Claravall, Viqui. "Differential Effects of a Phone Reminder on Appointment Keeping for Patients with Long and Short Between Visit Intervals." Medical Care 15:5 (May 1977): 435-438.
- Lion, Joanna; Henderson, Mary; Malbon, Alan; Wiley, Miriam; and Noble, John. "Ambulatory Visit Groups: A Prospective Payment System for Outpatient Care." Journal of Ambulatory Care Management (November 1984): 30-45.
- Lloyd, Susan and Rissing, J. Peter. "Physician and Coding Errors in Patient Records." Journal of the American Medical Association 254:10 (September 13, 1985): 1330-1336.
- Litt, Iris and Cuskey, Walter. "Satisfaction with Health Care." Journal of Adolescent Health Care 5:196 (July 1984): 196-200.
- Lopez, Mary S. Memorandum for Record: Report of Findings from Review of Laboratory and Radiographic Report Filing Backlog in the Directorate of Patient Administration. 23 December 1985.
- Maryland Hospital Education Institute. Hospital Sponsored Ambulatory Care. Chicago: American Hospital Association, 1980.
- Mechanic, David. Medical Sociology. New York: The Free Press, 1978.
- Mechanic, David. "The Organization of Medical Practice and Practice Orientations Among Physicians in Prepaid and Nonprepaid Primary Care Settings." Medical Care 8:3 (March 1975): 189-204.
- Meller, William and Anderson, Arnold. "Medical Compliance." Minnesota Medicine (September 1976): 625-626.
- Mestrovich, Michael. "Tracking Quality of Care in Military Hospitals." Business and Health (April 1986): 41-43.
- Metsch, Jonathan and Veney, James. "Consumer Participation and Social Accountability." Medical Care 14:4 (April 1976): 283-293.
- Mikolajczak, Anne and Nagel, L. J. Back to Basics: An Introduction to Principles of Quality Assurance. Chicago: JCAH, 1982.
- Miller, Robert. Problems in Hospital Law. Rockville, MD: Aspen Systems Corporation, 1983.
- Mumford, Emily. Medical Sociology. New York: Random House, 1983.
- Nathanson, Michael. "Computers Crank out DRG Cost Data, But How Valid is Information?" Modern Healthcare (September 1983): 160-164.
- Nathanson, Michael. "Experts: More Research Needed to Set Value of Code Programs." Modern Healthcare (June 1983): 98-102.

- Nazarian, Lawrence; Mechaber, Judith; Charney, Evan; and Coulter, Molly. "Effect of a Mailed Appointment Reminder on Appointment Keeping." Pediatrics 53:3 (March 1974): 349-352.
- Norusis, Marija J., Introductory Statistics Guide - SPSSX. Chicago: McGraw-Hill Book Company, 1983.
- Nutting, Paul and Shorr, Gregory. "Assessing the Performance of Medical Care Systems: A Method and its Application." Medical Care 19:3 (March 1981): 281-296.
- Odell, Myron. "Clinical/Ancillary Systems." Topics in Health Care Financing (1978): 31-42.
- Packer, C.L. "Integration, Performance Key to Ambulatory Care Information Systems." Hospitals (May 16, 1985): 120-122.
- Palmer, R. Heather. Ambulatory Health Care Evaluation: Principles and Practices. Chicago: American Hospital Association, 1983.
- Palmer, R. Heather. "Does Quality Assurance Improve Patient Care?" Clinical Research 31:2 (April 1983): 480A.
- Palmer, R. Heather, and Nesson, H. Richard. "A Review of Methods for Ambulatory Medical Care Evaluations." Medical Care 20:8 (August 1982): 758-781.
- Pascarella, Emil. Hospital Based Ambulatory Care. Norwalk, CT: Appleton-Century-Crofts, 1982.
- Payne, Beverly; Lyons, Thomas; Neuhaus, Evelyn; Kolton, Marilyn; and Dwarshius, Louis. "Method of Evaluating and Improving Ambulatory Medical Care." Health Services Research 19:2 (June 1984): 219-245.
- Pena, Jesus; Haffner, Alden; Rosen, Bernard; and Light, Donald. Hospital Quality Assurance. Rockville, MD: Aspen Systems Corporation, 1984.
- Raffel, Marshall. The U.S. Health System Origins and Functions. New York: John Wiley and Sons, 1980.
- Reid, Loy; Lewis, Charles; and Wathen, William. "The Texas Individual Responsibility Philosophy." Texas Dental Journal (October 1977): 15-17.
- Robinson, Donald. "The Mess in Military Medicine." Reader's Digest, February 1985, 49-53.
- Roemer, Milton. An Introduction to the U.S. Health Care System. New York: Springer Publishing Company, 1982.
- Roland, Neil. "Health Support Staff Can't Keep Pace." Army Times, 6 December 1982, 3.

- Roland, Neil. "Army Medicine: On the Mend." Army Times, 8 November 1982, 1.
- Rowland, Howard and Rowland, Beatrice. Hospital Administration Handbook. Rockville, MD: Aspen Systems Corporation, 1984.
- Rubright, Robert. Persuading Physicians. Rockville, MD: Aspen Systems Corporation, 1984.
- Sacco, John and Longnecker, Carl. "Patient Management Systems." Topics in Health Care Financing (1978): 17-29.
- Schroeder, Steven; Myers, Lois; McPhee, Stephen; Showstack, Jonathan; Simborg, Donald; Chapman, Susan; and Leong, Janice. "The Failure of Physician Education as a Cost Containment Strategy." Journal of the American Medical Association 252:2 (July 13, 1984).
- Schulberg, Herbert; Sheldon, Alan; and Baker, Frank. Program Evaluation in the Health Fields. New York: Behavioral Publications, 1969.
- Schwartz, Howard and Kart, Cary. Dominant Issues in Medical Sociology. Reading MA: Addison-Wesley Publishing Company, 1978.
- Sharbaro, John. "Compliance: Inducements and Enforcements." Chest 76:6 (December 1979): 750-756.
- Shepard, Donald and Moseley, Thomas. "Mailed Versus Telephoned Appointment Reminders To Reduce Broken Appointments in a Hospital Outpatient Department." Medical Care 14:3 (March 1976): 268-273.
- Shorr, Gregory and Nutting, Paul. "A Population-based Assessment of the Continuity of Ambulatory Care." Medical Care 15:6 (1977): 455-464.
- Shortell, Stephen. "Continuity of Medical Care: Conceptualization." Medical Care 14:5 (May 1976): 377-391.
- Snook, I. Donald. Hospitals: What They Are and How They Work. Rockville, MD: Aspen Systems Corporation, 1981.
- Spadaro, Daniel. "Factors Involved with Patient Compliance." Pediatric Nursing (July-August 1980): 27-29.
- Stein, Jane. "What Americans Think About Health Care." Business and Health (January/February 1986): 42-45.
- Steinwachs, Donald. "Ambulatory Care Management Information Systems: Future Directions." Journal of Ambulatory Care Management (May 1985): 84-94.
- Tesch, Bonnie; Lee, Helena; and McDonald, Mary. "Reducing the Rate of Missed Appointments Among Patients New to a Primary Care Clinic." Journal of Ambulatory Care Management (August 1984): 32-41.

- Thompson, Mark; Palmer, Heather; Rothrock, Janet; Strain, Rose; Brachman, Laura; and Wright, Elizabeth. "Resource Requirements for Evaluating Ambulatory Health Care." American Journal of Public Health 74:11 (November 1984): 1244-1248.
- Troyer, Glenn and Salman, Steven. Handbook of Health Care Risk Management. Rockville, MD: Aspen Systems Corporation, 1986.
- Tabachnick, Barbara, and Fidell, Linda. Using Multivariate Statistics. New York: Harper & Row, Publishers, 1983.
- U.S. Army, Organizational Effectiveness Center and School. Organizational Surveys: Development and Application. Fort Ord, CA: U.S. Army, 1983.
- Warwick, Donald and Liniger, Charles. The Sample Survey: Theory and Practice. New York: McGraw-Hill Book Company, 1975.
- Williams, Stephen and Torrens, Paul. Introduction to Health Services. New York: John Wiley and Sons, 1984.
- Wilmes, Lola. "Barriers to the Utilization of Health Care." The Oklahoma Nurse (May 1979): 3-5.
- Wortman, Paul. Methods for Evaluating Health Services. Beverly Hills, CA: Sage Publications, 1980.
- Wright, Kenneth. Interview on the Activities of TRIMIS Army. 16 April 1986.